<u>REDESIGNATION REQUEST</u>

and

<u>MAINTENANCE PLAN</u>

for the

<u>GLOVER, MISSOURI</u>
<u>LEAD (PB) NONATTAINMENT AREA</u>

Doe Run Primary Lead Smelter

Draft for Public Hearing
September 2003

Missouri Department of Natural Resources
Air and Land Protection Division

Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102
Telephone (573) 751-4817

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ABBREVIATIONS

APCP.. Air Pollution Control Program

CAAA ....1990 Clean Air Act Amendments

EPA ....Environmental Protection Agency

ISCST3 .... Industrial Source Complex Short Term, Version 3

MDNR ....Missouri Department of Natural Resources

NAAQS.. National Ambient Air Quality Standard

RACM... Reasonably Available Control Measure

RACT ....Reasonably Available Control Technology

SIP... State Implementation Plan

1.0 Introduction

1.1 Purpose

The purpose of this submittal is to provide the information and justification to request a redesignation of the Glover, Missouri lead (Pb) nonattainment area located in Iron County, Missouri. This document will serve as the formal submittal to the Environmental Protection Agency (EPA) establishing a maintenance plan and requesting the redesignation of the Glover nonattainment area.

1.2 Clean Air Act Redesignation Requirements

Section 107(d)(3) of the 1990 Clean Air Act Amendments (CAAA) sets forth the process for redesignation and specifies that the Administrator may not promulgate a redesignation of a nonattainment area to attainment unless—

- (i) The Administrator determines that the area has attained the national ambient air quality standard (NAAQS);
- (ii) The Administrator has fully approved the applicable implementation plan for the area under Section 110(k);
- (iii) The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reductions;
- (iv) The Administrator has fully approved a maintenance plan for the area as meeting the requirements of Section 175A and;
- (v) The state containing such area has met all requirements applicable to the area under Section 110 and CAAA part D.

This submittal serves to document that the Section 107(d)(3) requirements will be satisfied. It includes documentation of air quality data showing that the area is in compliance with the National Ambient Air Quality Standard (NAAQS) for lead.

This submittal is also intended to satisfy the requirements of Section 175A of the CAAA. This plan includes an emission inventory, a maintenance demonstration, a set of permanent and enforceable emission control projects, and contingency measures. Future emissions are projected, and a modeling demonstration (Appendix B: Doe Run Glover Redesignation Request Dispersion Model Review) shows that there will not be an exceedance of the National Ambient Air Quality Standard (NAAQS) for lead.

1.3 History

The Glover smelting facility was constructed by ASARCO Incorporated in 1968 prior to the Clean Air Act and any of the associated permitting or air pollution controls.

The Clean Air Act Amendments of 1977 required each state to submit an implementation plan for the control of specific pollutants known as criteria pollutants. The following year EPA promulgated a NAAQS standard for lead (October 5, 1978) of 1.5 micrograms per cubic meter averaged over a calendar quarter.

In response to the standard Missouri requested that three areas of the state be designated as nonattainment for lead. The boundaries encompassed the areas surrounding the three primary lead smelters that were operating in the state at that time (March 14, 1991). This included the smelter located in Glover, Missouri that was then operated by ASARCO Incorporated.

The Missouri Department of Natural Resources (MDNR) developed and implemented the first lead plan in 1980. This plan listed mobile sources, mining operations, and primary smelters as significant contributors to lead emissions. Suggested controls for these sources were good housekeeping for mining operations, baghouses for smelters, and the phase-out of Tetra-Ethyl lead from gasoline. Violations of the NAAQS for lead continued.

In 1990, ASARCO began operating a lead monitoring network that over the years has been expanded to seven high volume ambient air monitors near the facility. Several violations of the NAAQS were subsequently recorded.

EPA formally designated the Glover area as a nonattainment area for lead in January of 1992. A cooperative effort between the Missouri Department of Natural Resources' Air Pollution Control Program (APCP), EPA, and ASARCO was begun shortly thereafter to develop the necessary methods for the preparation of a lead emission control strategy to bring the area into attainment with the NAAQS.

This plan was adopted by the Missouri Air Conservation Commission on February 29, 1996 submitted to EPA on August 13, 1996. EPA found the plan complete on September 18, 1996 and formally approved the plan on May 5, 1997. All of the emission control projects were installed on time, and the capital projects were completed by December 31, 1996. This plan was made enforceable by three mechanisms; 10 CSR 10-6.120 Restriction of Emissions of Lead from Specific Lead Smelter-Refinery Installations, a Consent Judgement, and a Manual of Work Practices. The capital costs of the emission controls installed at the plant were approximately $18 million with an additional $1.2 million in ongoing annual operating expenses.

On August 30, 1998, the Doe Run Company acquired all of ASARCO's Missouri lead interests including the Glover smelter. The State Implementation Plan (SIP) was revised to reflect the change in ownership. Doe Run agreed to accept the conditions of the original consent decree with minor changes. The SIP revision was submitted to EPA on July 31, 2000 and was formally approved on April 16, 2002.

As a direct result of the SIP controls required in the 1996 SIP revision, air monitors in the Glover nonattainment area have shown continuous compliance with the quarterly standard since the beginning of 1997.

2.0 Description of the Nonattainment Area

2.1 EPA Description

EPA designated the portion of Iron County within the boundaries of the Liberty and Arcadia Townships as nonattainment for the lead NAAQS in 56 Federal Register 56694, November 6, 1991, effective January 6, 1992. These townships, therefore, represent the legal boundaries of the Glover nonattainment area. The nonattainment boundaries are shown in Figure 1 (page 4). This designation was based primarily on ambient monitoring data from the Hogan location that indicated exceedances of the lead NAAQS. This monitor is located north of the Glover smelter.

2.2 Location and Topography

Glover, Missouri is located in a north-south oriented valley in Southeastern Missouri. The terrain surrounding the valley is comprised of low, heavily vegetated and timbered hills, with crests approximately 600 to 800 feet above the valley floor. The valley is narrow, approximately 0.5 miles wide, near the smelter.

The valley is drained by Big Creek, a permanent stream flowing to the south. Big Creek is a tributary of the St. Francois River drainage. Figure 2 (page 5) is a map showing the topography near the plant.

Section 175A of the CAAA requires that the maintenance plan provide for maintenance of the lead NAAQS for at least ten (10) years after EPA's designation of attainment of the standard. Any changes in land boundaries will be reported to the MDNR by Doe Run within 90 days. A review of the land ownership change will then be made to determine whether a plan revision is needed.

By EPA's definition of ambient air (40 CFR 50.1 (e)), public access must be restricted to smelter-owned or controlled property where there is potential for the lead NAAQS to be exceeded. Fencing was installed to enclose the approximate area within the 1.5 ug/m^3 isopleth as part of the 1996 SIP revision. Currently, ambient air in the vicinity of the smelter is in compliance with the NAAQS for lead. No increase in fenced area is required, and fencing required by the 1996 SIP revision will remain throughout the duration of the maintenance plan.

2.3 Meteorology

2.3.1 Wind

There are two primary wind patterns in the valley in the Glover area. Winds from the south predominate during daylight hours between roughly 8:00 A.M. through 9:00 P.M. dependent on season, with speed varying considerably up to 4.0 meters per second or greater. Winds from the north-northeast predominate during evening hours caused by valley drainage flow. These winds are generally light and variable, up to 5.0 meters per second or greater.

Figure 1. Glover Non Attainment Area

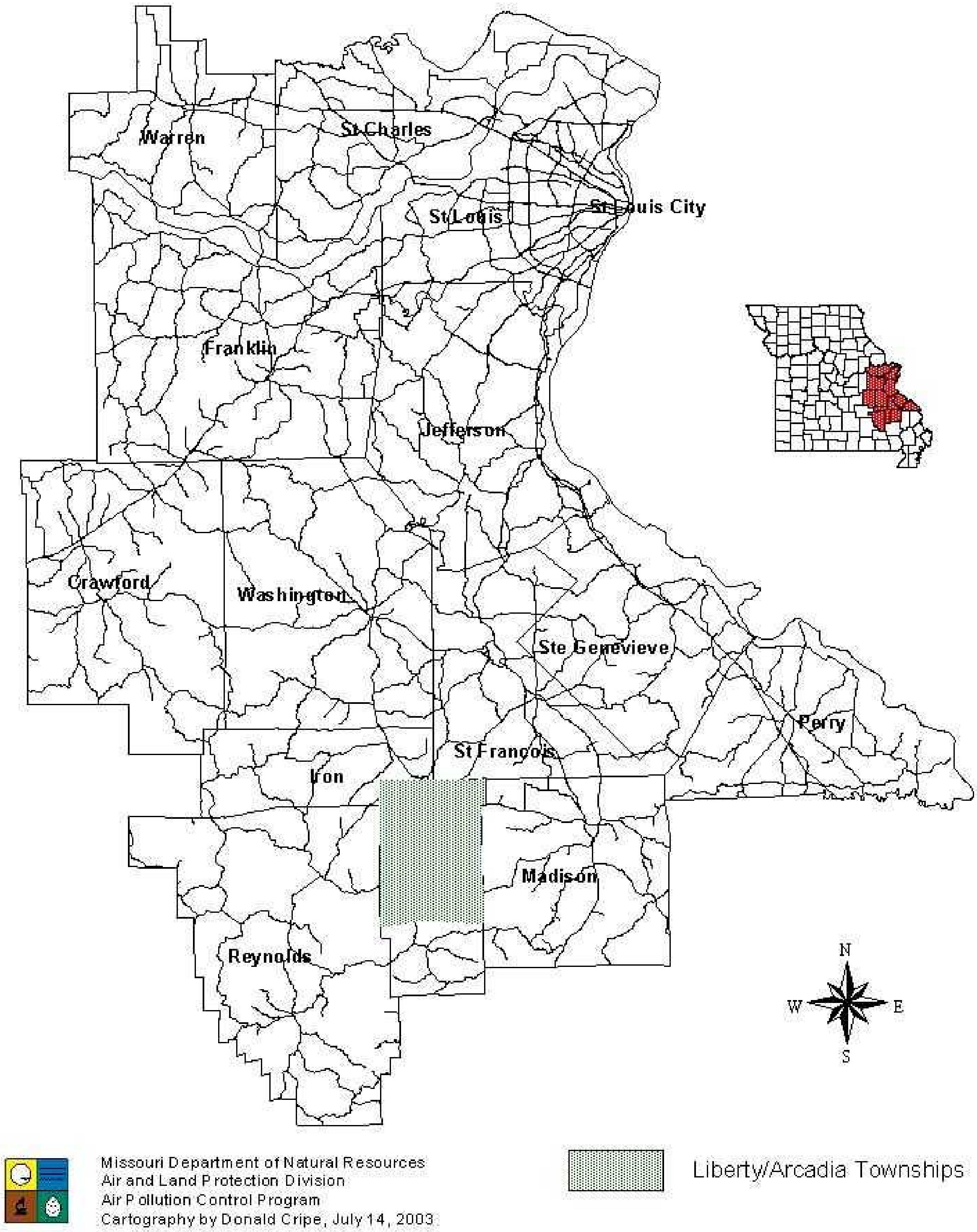
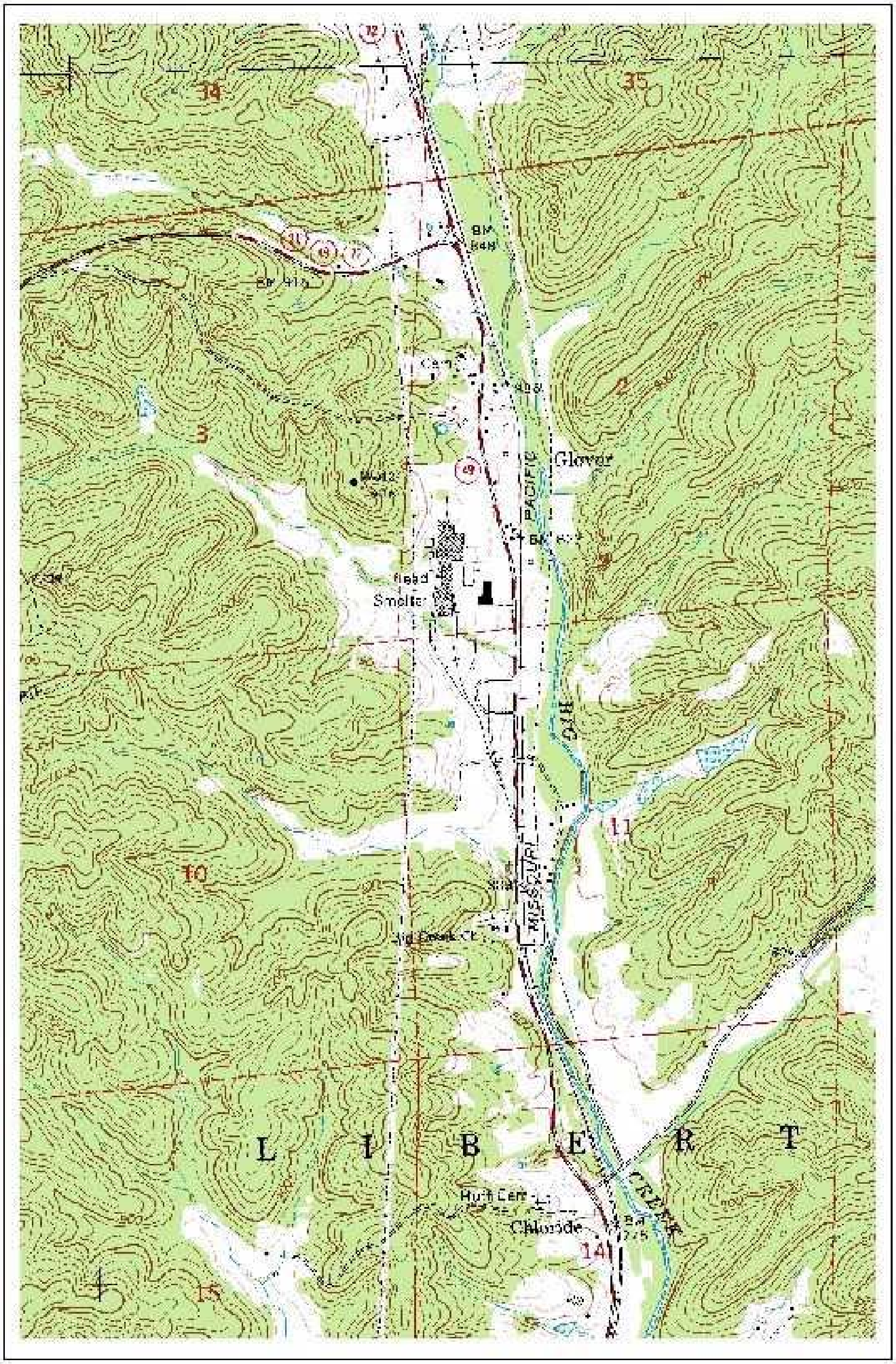


Figure 2. Glover Area



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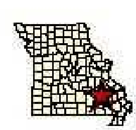


During synoptic conditions associated with northwestern weather fronts, winds can achieve significant speeds, up to 8.0 meters per second from the northwest.

Topographical influences to winds speed and direction have been observed in the Glover area. The most noticeably influence occurs when winds from the north-northeast are deflected by as much as 50 degrees back toward the south-southeast by the ridge that runs along the west side of the valley, directly adjacent to the facility.

2.3.2 Precipitation and Temperature

The Glover area averages 42.7 inches of precipitation per year, mostly as rain. Snow falls occasionally during the winter months.

Annual average seasonal temperatures are provided in Table 1.

Table 1

Seasonal Average Temperatures
Glover, Missouri

Period	Average High (°F)	Average Low (°F)
January – March	49	23
April – June	70	40
July – September	89	59
October – December	57	31

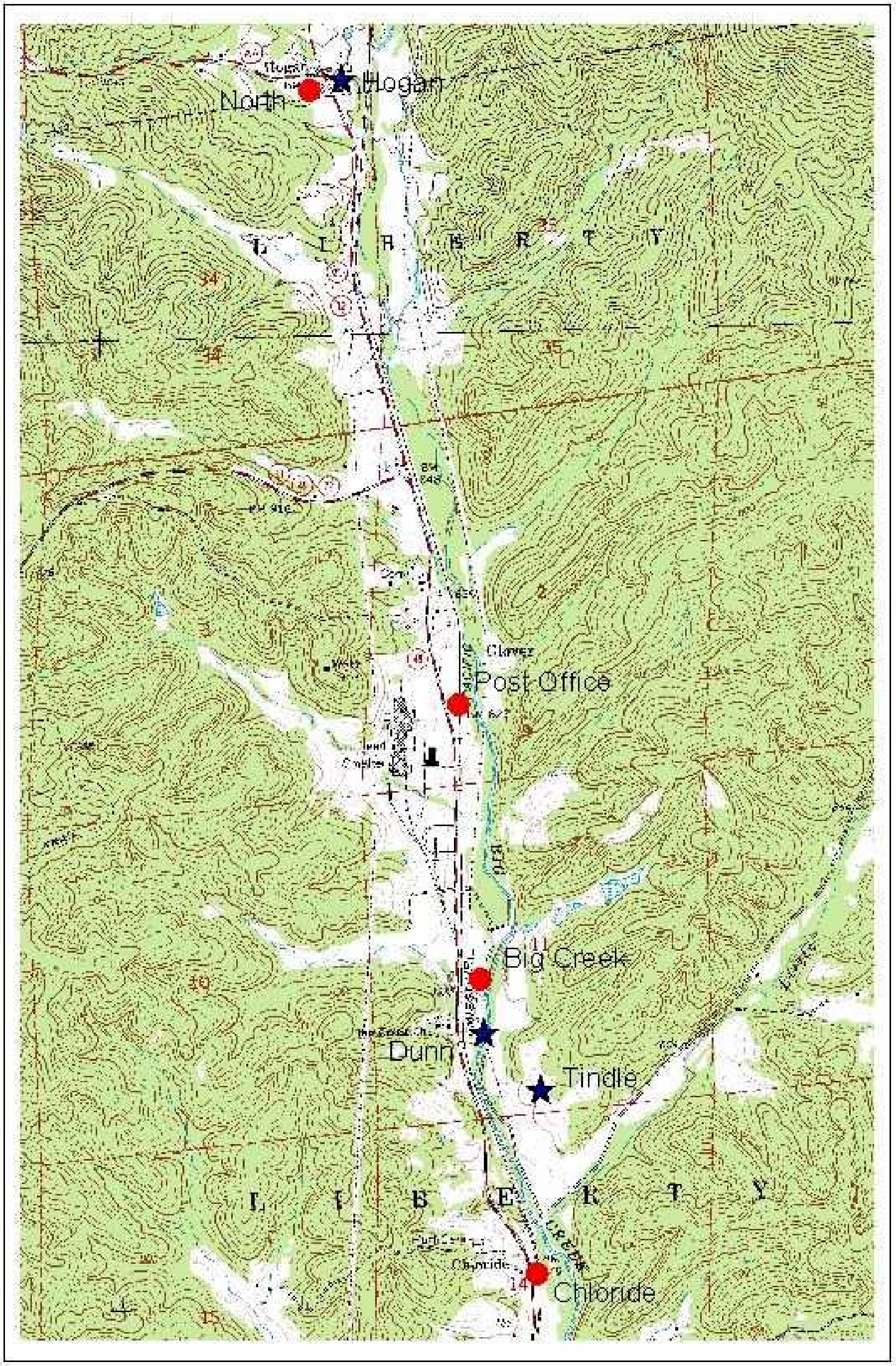
2.4 Summary of Air Quality Data

An ambient air monitoring station was installed by the state in 1987 at the Hogan site, which is approximately two miles north of the facility. Ambient lead concentrations measured by this monitor showed NAAQS exceedences, which was the basis for declaring this a nonattainment area in 1991.

A second state monitor (Dunn Residence) was installed in 1991 approximately three-quarter miles south of the facility. The ASARCO Company installed four additional ambient lead monitors. Figure 3 (page 7) shows the location of the ambient air monitoring network in the Glover nonattainment area. Table 2 provides a summary of the quarterly lead values measured at these monitors.

From the time the first lead monitor was installed in 1987 until the most recent emission controls were completed in December of 1996 the NAAQS standard was frequently violated. For some quarters monitors reported as much as ten times the standard. Violations were recorded at each monitoring location. Figure 4 (page 11) shows the historic lead concentrations. Most importantly, this Figure shows that there have been no violations of the NAAQS after December of 1996 when the emission controls were installed as part of the 1996 SIP effort.

Figure 3. Glover Monitor Locations



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● Doe Run Operated

★ State Operated

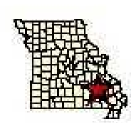


Table 2

Lead Ambient Air Quality Data – Vicinity of Doe Run, Glover, MO Smelter
Years 1990 to 1994

CALENDAR QUARTER VALUES
in micrograms of lead per cubic meter of air (ug/m^3)

HI-VOL MONITOR LOCATIONS

Date	S[1] Hogan	A[2] North	S Dunn	A Big Creek	A Post Office	A Chloride	S Tindle
1990							
1st	1.9[2]						
2nd	0.8						
3rd	1.3						
4th	3.1						
1991							
1st	2.2						
2nd	1.6						
3rd	2.1		7.4[2]				
4th	1.9		10.3				
1992							
1st	0.9		5.3				
2nd	2.3	3.0[2]	7.0	6.0[2]	5.1[2]	1.0	
3rd	1.3	1.3	5.7	5.5	3.0	1.0	
4th	1.2	1.6	4.0	9.7	4.3	1.4	
1993							
1st	1.1	1.2	5.8	9.2	3.8	1.6[2]	
2nd	1.4	1.4	4.9	8.9	4.4	1.7	
3rd	2.0	2.6	6.1	13.3	6.2	1.5	1.9[2]
4th	1.7	5.1	13.4	23.6	9.4	2.8	2.8
1994							
1st	1.9	2.7	6.4	8.8	5.8	2.1	1.8
2nd	0.9	1.4	6.4	14.2	7.9	2.1	1.3
3rd	0.9	1.5	7.2	12.3	10.0	1.9	1.2
4th	1.1	1.2	6.6	7.3	4.9	1.6	1.1

NOTES:
[1] (S) = State Monitor, (D) = Doe Run Monitor.

[2] Underlined Quarterly Air Quality Values exceed the National Ambient Air Quality Standard for lead (NAAQS); the NAAQS for lead is 1.5ug/m^3 and is the arithmetic mean of a series of daily (24-hour) values from hi-vol monitors measuring particulate matter, within a 3-month (calendar quarter) period.

Table 2 (Cont.)

Lead Ambient Air Quality Data – Vicinity of Doe Run, Glover, MO Smelter
Years 1995 to 1999

CALENDAR QUARTER VALUES
in micrograms of lead per cubic meter of air (ug/m^3)

HI-VOL MONITOR LOCATIONS

Date	S[1] Hogan	A[2] North	S Dunn	A Big Creek	A Post Office	A Chloride	S Tindle
1995							
1st	1.4	0.8	4.8	4.4	2.3	1.0	1.4
2nd	1.1	0.9	5.0	4.1	6.9	0.9	1.3
3rd	0.6	0.6	7.3	8.1	3.0	1.2	1.6
4th	2.0	1.6	5.2	5.4	5.1	1.2	1.5
1996							
1st	2.1	1.3	7.7	6.7	2.5	1.7	2.8
2nd	1.3	1.2	9.1	9.9	4.1	1.5	1.9
3rd	0.5	0.4	7.2	7.7	1.8	1.2	1.6
4th	1.7	1.4	4.4	7.8	2.5	1.2	1.6
1997							
1st	0.3	0.3	0.7	0.8	0.8	0.2	0.2
2nd	0.1	0.2	0.7	0.9	0.6	0.3	0.2
3rd	0.2	0.3	1.1	1.3	0.6	0.3	0.3
4th	0.1	0.2	0.6	0.7	0.5	0.3	0.3
1998							
1st	0.1	0.2	0.3	0.3	0.5	0.1	0.1
2nd	0.1	0.2	0.3	0.4	0.7	0.1	0.1
3rd	0.1	0.1	0.3	0.4	0.7	0.1	0.1
4th	0.3	0.2	0.9	0.9	0.7	0.3	0.3
1999							
1st	0.2	0.2	0.7	0.7	0.3	0.3	0.2
2nd	0.2	0.2	0.7	0.6	0.8	0.2	0.2
3rd	0.2	0.2	1.1	1.1	0.6	0.2	0.2
4th	0.2	0.3	1.2	1.1	0.7	0.3	0.3

NOTES:
[1] (S) = State Monitor, (D) = Doe Run Monitor.

[2] Underlined Quarterly Air Quality Values exceed the National Ambient Air Quality Standard for lead (NAAQS); the NAAQS for lead is 1.5ug/m^3 and is the arithmetic mean of a series of daily (24-hour) values from hi-vol monitors measuring particulate matter, within a 3-month (calendar quarter) period.

Table 2 (Cont.)

Lead Ambient Air Quality Data – Vicinity of Doe Run, Glover, MO Smelter
Years 2000 to 2003

CALENDAR QUARTER VALUES
in micrograms of lead per cubic meter of air (ug/m^3)

HI-VOL MONITOR LOCATIONS

Date	S[1] Hogan	A[2] North	S Dunn	A Big Creek	A Post Office	A Chloride	S Tindle
2000							
1st	0.3	0.2	0.7	0.6	0.8	0.2	0.2
2nd	0.3	0.2	0.7	0.7	0.7	0.1	0.2
3rd	0.2	0.2	0.9	1.0	0.6	0.2	0.2
4th	0.3	0.3	0.9	0.9	0.7	0.3	0.3
2001							
1st	0.4	0.4	1.1	1.2	0.8	0.4	0.4
2nd	0.3	0.3	0.8	0.8	0.8	0.3	0.2
3rd	0.2	0.2	0.9	1.1	0.3	0.3	0.2
4th	0.2	0.3	1.1	1.0	0.8	0.3	0.2
2002							
1st	0.3	0.3	0.8	0.8	0.6	0.3	0.2
2nd	0.3	0.2	0.8	0.7	0.4	0.2	0.2
3rd	0.1	0.2	0.7	0.8	0.6	0.2	0.1
4th	0.4	0.5	0.9	1.0	0.8	0.5	0.3
2003							
1st	0.3	0.3	0.6	0.7	0.9	0.2	0.2

NOTES:
[1] (S) = State Monitor, (D) = Doe Run Monitor.

[2] Underlined Quarterly Air Quality Values exceed the National Ambient Air Quality Standard for lead (NAAQS); the NAAQS for lead is 1.5ug/m^3 and is the arithmetic mean of a series of daily (24-hour) values from hi-vol monitors measuring particulate matter, within a 3-month (calendar quarter) period.

Figure 4: Historic Glover Ambient Lead Concentrations

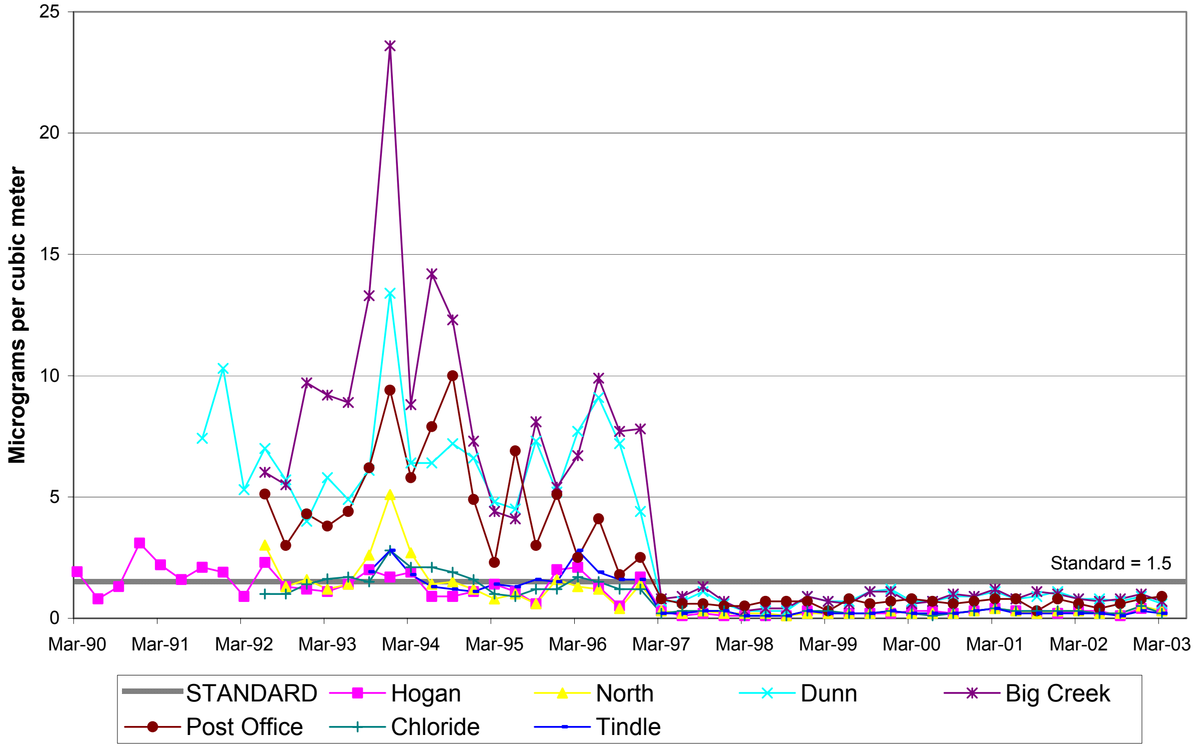
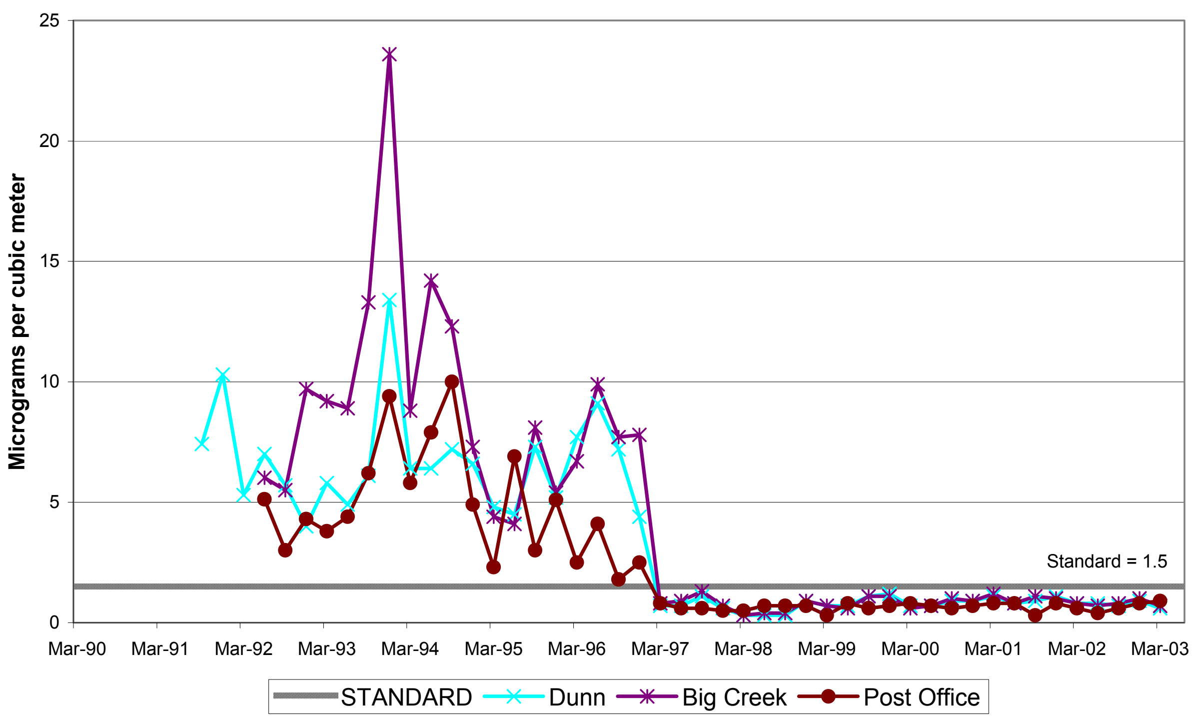


Figure 5: Lead Concentrations at High Concentration Monitors in Glover



The three closest monitors (Dunn, Big Creek, and Post Office) typically recorded the highest ambient lead concentrations. Figure 5 (page 11) shows the concentrations recorded at these three monitoring locations.

Figure 6 (page 13) shows the ambient lead concentrations recorded at the more distant monitors (Hogan, North, Chloride, Tindle). Although these monitors are located some distance from the plant and typically show lower concentrations than the monitors located closer to the plant, they do show historic violations of the NAAQS. As in Figure 5, Figure 6 shows that there have been no violations of the NAAQS after the emission controls were completed in December of 1996.

Figure 7 (page 13) charts the lead concentrations recorded at all monitors starting with the first quarter of 1997. This Figure shows not only that the NAAQS standard has not been violated over the time period, but also that the results show concentrations significantly lower than the NAAQS standard. The highest quarterly value reported since the emission controls were installed was 1.3 micrograms per cubic meter (3rd quarter, 1997, Big Creek). Since the emission controls were installed the highest quarterly value has averaged 0.9 micrograms per cubic meter, well below the 1.5 NAAQS standard.

Figure 6: Lead Concentrations Low Concentration Glover Monitors

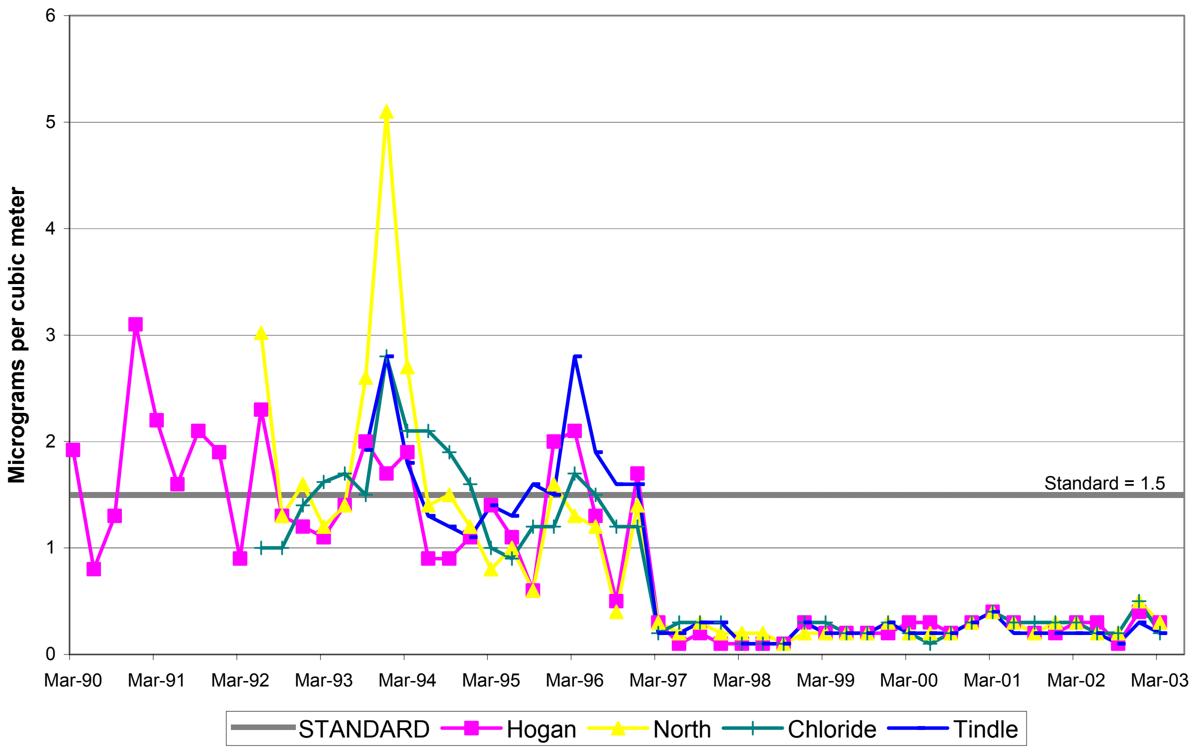
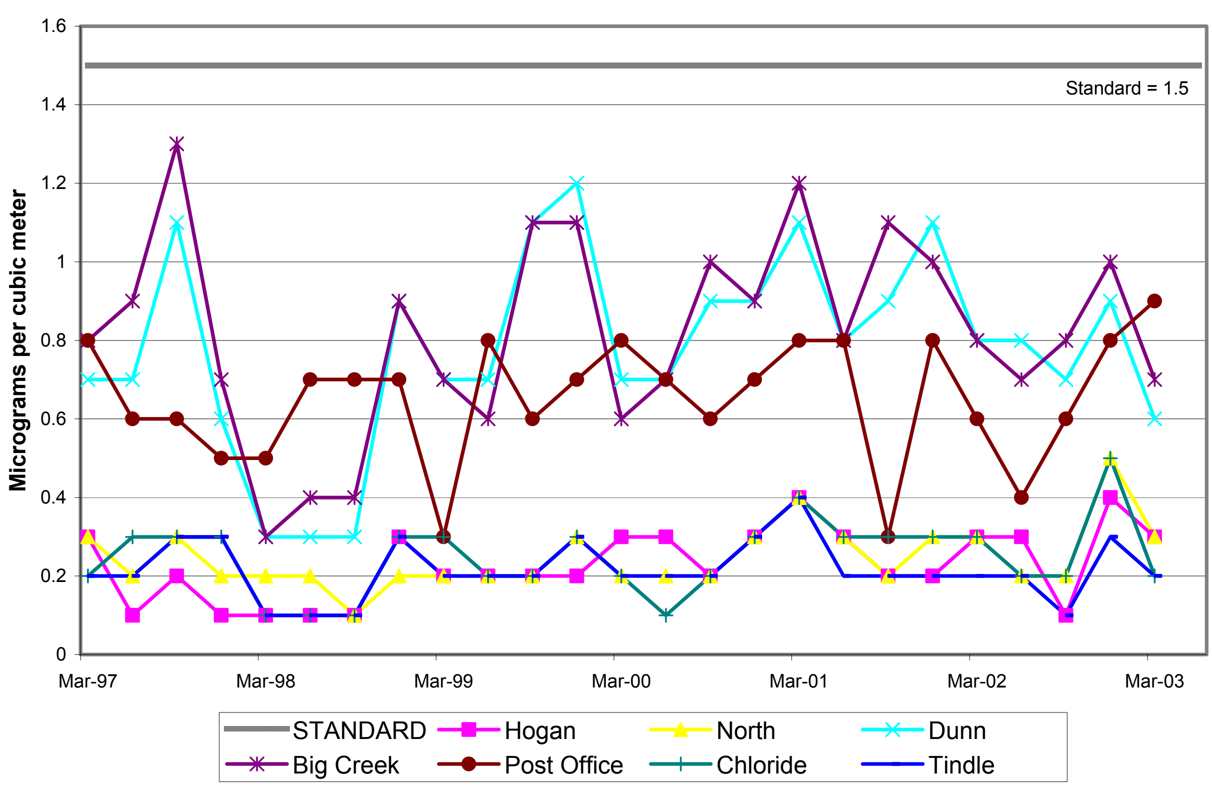


Figure 7: Air Monitoring Results After SIP Emission Controls Installed



3.0 Development of Dispersion Model Inputs

Central to the maintenance demonstration is the use of a predictive dispersion model based in large part on the attainment demonstration modeling used in the 1996 SIP revision. This model used emission rates and meteorological inputs to predict ambient air concentrations in the Glover nonattainment area.

The development of this dispersion model involved several tasks including the refining of an emission inventory and the development of a meteorological data base. A summary of the modeling study is given in Appendix B (Doe Run Glover Redesignation Request Modeling Review).

3.1 Model Input Development

3.1.1 Model Selection

In support of the maintenance plan demonstration, a dispersion modeling methodology was developed to predict ambient lead concentrations. The dispersion model chosen was the EPA Gaussian plume model, Industrial Source Complex Short Term, Version 3 (ISCST3), which is currently EPA's primary model for point and volume sources. The control strategy modeling of the 1996 SIP revision was done using the earlier ISCST2 version of the model.

In the 1996 SIP revision there were plans to incorporate a chemical mass balance receptor model to reconcile the dispersion modeling effort. This effort was dropped because there were some laboratory inconsistencies identified, and it was felt that the results would not be quantitative. The results were valid for qualitative comparisons, however.

3.1.2 Meteorological Data

A meteorological data base, suitable for use in the ISCST3 model was compiled by collecting surface wind, stability and temperature data from the Post Office meteorological monitoring site. This site is located 0.3 miles north-northeast of the facility.

In addition, contemporaneous mixing heights were calculated from twice-daily upper-air temperature measurements made at Springfield, Missouri. This data was compiled into model ready data-sets. In total, approximately fifteen quarters of meteorological data were simulated.

3.1.3 Emission Inventory

An inventory of lead emission rates for all of the lead sources at the Glover facility was used to provide input to the ISCST3 ambient lead concentration calculations. For the most part the emission rates used in the modeling exercise were the ones developed in the 1996 SIP revision. There are several emission rates that have been modified because of changes made at the plant.

In some cases emission estimates were based on actual emission testing, and in other cases the estimates were made using standard air pollution engineering assumptions. The detailed development of the emission inventory was documented in the 1996 SIP revision. In a few cases emissions from individual emission points follow an operating schedule.

3.1.4 Modeling Methods

In addition to the ambient concentrations predicted by the model, it is necessary to determine a background lead concentration for the Glover area. In the 1996 SIP revision a review of the ambient monitoring data was performed to determine the background. Data from the Hogan and Chloride monitors was reviewed to find monitoring days during which the wind blew form the monitor toward the plant during all twenty-four hours. This provided measurements for days that would likely be unaffected by sources at the plant. The results of this study showed that for most cases the background levels were 0.1 microgram per cubic meter. There were, however, some anomalous days, therefore, a more conservative background level of 0.14 micrograms per cubic meter was chosen. This same background was used for the maintenance demonstration modeling.

3.1.5 Modeling Results

The results of the modeling exercise show continued maintenance of the NAAQS for lead, and support this redesignation request. A summary of the modeling study is given in Appendix B, “Doe Run Glover Redesignation Request Dispersion Modeling Review”.

4.0 Emission Controls

With the exception of the dross kettle process, all of the emission controls that were established in the 1996 SIP revision are being retained in the maintenance plan. This section briefly describes each of the emission control projects. The dross kettle process was changed since the 1996 SIP revision to further reduce lead emissions by leaving the covers off these kettles so that the lead bullion cools, resulting in lower emissions during transfer operations.

All of the controls listed below will be continued for a minimum of ten years as part of the maintenance plan.

4.1 Concentrate Unloading

Prior to the 1996 SIP revision, trucks carrying lead concentrate from the mines were dumped at the south end of the plant, through a screening device, into rail cars. The rail cars were then transported by locomotive to the Unloading Building where they were dumped into storage bins. Emissions from concentrate unloading were found to occur in three ways: 1) dust becoming airborne during the dump from truck to railcar, 2) dust coming off of truck wheels as they drove over spilled or tracked concentrate, and 3) dust becoming airborne from wind erosion. The control for this source was to eliminate all south end unloading. Trucks hauling concentrate are now routed directly to the Unloading Building. The haul route in the plant is controlled by a combination of pavement, sweeping, and watering. Concentrate trucks now dump directly into the storage bin, eliminating one dump event. The area around the old south end concentrate unloading area was cleaned and stabilized to eliminate further wind erosion of dust.

The control efficiency of this measure is 100%.

4.2 Sinter Plant (Process Gas) Baghouse Stack

Gases from the Sinter Machine used to be routed to an older baghouse. A new baghouse to treat these gases was installed. This new baghouse, using state of the art design, is more efficient and is required to meet a 0.01 grains per dry standard cubic foot emission specification. The gases leaving this new baghouse are routed to the 186 meter stack.

4.3 Sinter Plant Wheelabrator Baghouse Stack

This baghouse, located inside the Sinter Plant Building, cleans the point source ventilation gases from the crushing and sorting of sinter produced from the Sinter Machine. The point source ventilation gases originally passed through this baghouse and exited the roof of the building through the Sinter Plant Ventilation Baghouse Stack.

The updraft fans for the Sinter Machine draw air across the bed of feedstock to maintain the thermal removal of sulfur from the concentrate. This air was originally drawn from the ambient air inside the building. The 1996 SIP revision required that the gases emitted from the Wheelabrator Baghouse be rerouted to the intake of the Sinter Machine Updraft Fans. The Wheelabrator Baghouse Stack has been eliminated, therefore the control efficiency of this measure is 100%.

4.4 Sinter Plant Wet Scrubber

This scrubber cleans the ventilation gases from the crushing and mixing of virgin feedstock for the Sinter Machine. This feedstock consists primarily of concentrate and flux. The emissions from this scrubber used to exit the roof of the Sinter Plant Building.

The exit gases have been rerouted to the intake of the Sinter Machine Updraft Fans as part of the 1996 SIP revision. This emission point has therefore, been eliminated.

4.5 Unloading Building Fugitives

Fugitive emissions from the Unloading Building occur from the handling of various feedstock materials. The significant lead-bearing materials include concentrate and sinter.

Most of the handling is with an overhead bucket crane that moves materials from storage bins into feed hoppers for the Sinter Plant and Blast Furnace. The feed hoppers automatically feed material onto conveyor belts to feed the Sinter Plant or into a charge car for feed to the Blast Furnace. The amount transferred by the feed hoppers is controlled by weigh-meters. The crane also arranges the material inside the storage bins.

A significant source of emissions in the Unloading Building used to come from sinter handling. The sinter originally came from the sinter machine and was dropped approximately forty-five feet from a conveyor to the floor of the Sinter Storage Bin in the Unloading Building. The bucket crane then moved this material into the feed hoppers for return to the Sinter Machine (recycle stream). It was estimated that under this previous configuration sinter handling operations created 49 percent of the total Unloading Building emissions, based on the mass of lead-bearing material handled.

The sinter handling operations were modified in the 1996 SIP revision. An enclosed conveyor system was constructed that deposits the sinter directly into one of the three hoppers that feed the charge car. This eliminated one dump event 70 percent of the time, and thereby reduced the rearranging of sinter material by overhead crane by 70 percent as well. In addition, the drop height of the sinter was reduced to approximately ten feet.

The combination of reduced handling and lower drop point reduced Unloading Building fugitives by an estimated 39.4 percent.

In addition to requiring the modification of the sinter handling system, the 1996 SIP revision required the enclosure of the Unloading Building. Prior to the 1996 SIP revision, the west and north sides of the Unloading Building were approximately 50 percent open. The building was enclosed using siding and roll-up doors. The 1996 SIP did not address the roof monitor vents. The enclosure of the Unloading Building reduced fugitive emissions and the resulting emission rate was based on 39.4 percent control of the available dust in the building.

The total control efficiency of the emission controls required in the 1996 SIP revision from the Unloading Building was estimated to be 63.3 percent.

The Doe Run Company has further reduced emissions from the Unloading Building after the 1996 SIP revision. The roof monitors have been completely enclosed.

4.6 Sinter Plant Fugitive Emissions

Fugitive emissions from the Sinter Plant Building are created by sources inside the building as well as losses from point source ventilation systems. Emissions are caused by dust falling off conveyor belts, dust lost from crushing and screening activities, dust emanating from conveyor belt drop points, and other similar material handling steps. Prior to the 1996 SIP revision these emissions exited the Sinter Plant Building through the open sides and roof monitors, carried by winds and thermal currents.

As a requirement of the 1996 SIP revision, the Sinter Plant Building was fully enclosed by a combination of siding and doors, and the building was ventilated. The ventilation gases collected from inside the enclosed Sinter Plant Building were routed to the original Sinter Plant Baghouse. The total emission rate of this baghouse was restricted to 0.01 grains per dry standard cubic foot. The gases exiting this baghouse were routed to a new stack located next to the original Sinter Machine Baghouse Stack. The combined effective control efficiency of sinter plant fugitives was 99.8 percent.

4.7 Replacement of 3360 Conveyor Belt

3360 Conveyor Belt was located inside the Sinter Plant Building and transported return sinter to the machine feed. Emissions were generated at drop points, and from belt spillage and losses from under the belt. As part of the 1996 SIP revision 3360 Belt Conveyor, 3250 Pan Conveyor, and the Corrugated Rolls Crusher were replaced by a conveyor belt directly from “R” Hopper to the Smooth Rolls Crusher, thus eliminating these drop points.

This project reduced emissions inside the Sinter Plant Building, and improved indoor air quality.

4.8 Extension of the Main Feed Conveyor Belt

Prior to the 1996 SIP revision the Main Feed Conveyor Belt transferred Singer Machine Feed to a shorter shuttle conveyor which then fed the mixing drum. Emissions were generated at the various drop points and other belt losses.

As part of the 1996 SIP revision the Main Belt was extended directly to the Mixing Drum, eliminating the shuttle belt and eliminating a drop point. This project reduced emissions inside the Sinter Plant Building, improving indoor air quality.

4.9 Blast Furnace Fugitive Emissions

Fugitive emissions in the blast furnace area are generated at furnace openings and from the

Dross Kettles. In the 1996 SIP revision blast furnace fugitive emissions were measured as they exited the roof monitor. The contributions of the total emissions from the different processes in the Blast Furnace Building were estimated by simultaneously collecting air samples from four areas: 1) above the refinery (on the overhead crane), 2) the dross kettle area, 3) the top of the furnace, and 4) the front of the furnace. The ratio of lead mass collected in each area to the total collected was interpreted as the contribution factor from each area.

Of the total blast furnace area contributions, the contributions were estimated to be: dross kettles - 63.2 percent; top of the furnace – 8.8 percent; and front of the furnace 28 percent.

The 1996 SIP revision required an additional 33,000 actual cubic feet per minute dedicated to the kettle that is receiving bullion from the furnace. This represented a 925 percent increase in ventilation volume.

The 1996 SIP revision also required that the dross kettles be kept covered and ventilated. It has been found, however, that most of the emissions occur during kettle dumping events. When using the covers, the bullion doesn't cool, and more emissions are created during dump events. Instead, Doe Run now leaves the covers off allowing time for the kettles to cool. By doing this emissions are reduced when there is a dump event. In the 1996 SIP, emissions from covering and ventilating the dross kettles was given a 95 percent control efficiency. For the maintenance plan this control efficiency was maintained.

The 1996 SIP revision also required emission controls in the front of the furnace. This resulted in an estimated 66 percent reduction in emissions from this area. The control measures included: 1) the ventilation system as dedicated to the front of the furnace at a constant ventilation rate of 65,500 actual cubic feet per minute, and routed to the Blast Furnace Baghouse, 2) the Slag Launder Hood was redesigned and expended to vent the entire length of the launder, 3) a new hood over the emergency slag opening on the Settler Cover was added and constantly ventilated, and 4) the Lead Well Hood was modified so that the lead well will be ventilated even when a lot pot is being changed.

4.10 In-plant Roads

Emissions from these sources are created by vehicles on primary traffic routes causing dust on the road surface to become airborne. In the 1996 SIP revision, there were several measures that were required to reduce these emissions. The 1996 SIP revision required that all of the primary traffic routes in the plant be paved, and that the haul road watering system be expanded to further reduce in-plant road emissions. The combined control efficiency of the in-plant control measures required in the 1996 SIP revision is 95 percent.

5.0 RACM and RACT Analysis

The CAAA requires that implementation plans for non-attainment areas provided for all Reasonably Available Control Measures (RACM) including emission reductions obtained through the adoption of Reasonably Available Control Technology (RACT). As part of the 1996 SIP revision effort, RACT controls were reviewed for this plant.

EPA defines RACT as the lowest emission limitation that a particular source can beat by the application of control technology that is reasonably available considering technological and economic feasibility.

The technology feasibility of applying an emission reduction method to a particular source considers the source's process and operating procedures, raw materials, and physical plant layout. The process, operating procedures, and raw materials used by the source can affect the feasibility of carrying out process changes that reduce emissions and the selection of add-on emission control equipment. The operation and longevity of control equipment can be significantly influenced by the raw materials used and the process to which it is applied. The feasibility of modifying processes or applying control equipment is also influenced by the physical layout of a particular plant. The space available in which to carry out such changes may limit the choices of control. Furthermore, control measures that are not proven effective or reliable in a commercial application would not be considered reasonably available.

Determinations of technological feasibility considers the cost of reducing emissions and the difference in costs between the particular source for which RACT is being determined and other similar sources that have implemented emission reductions. In practice however, economic feasibility is closely tied to technological feasibility, in that, a control measure would not be considered technologically (nor economically) feasible if the control measure was not proven reliable in a commercial application, bearing commercial economic considerations. In addition, if a control measure did not achieve a sufficient amount of emission reduction, technological (and economic) feasibility questions are not useful to pursue. The use of a Cost Effectiveness comparison, where Cost Effectiveness simply divides annualized cost by emissions reduced, can be a useful tool in comparing control measures for a single given source. Economic comparisons between sources and between commercial installations involve so many variables that any conclusions drawn from them are of informational quality at best.

Determinations of RACT must also consider the attainment needs of the area. RACT does not require that all available measures be implemented, only that attainment of the NAAQS be demonstrated.

Pursuant to Section 172 of the CAAA, an analysis of RACMs was done for the Doe Run, Glover Smelter. Relevant EPA guidance provides fifteen generally applicable control measures for controlling fugitive lead-bearing dust. The RACM analysis requires that such measures that are needed to achieve attainment are also effective, feasible, and reasonable. These considerations must be incorporated into the selection of the control strategy.

The Doe Run Glover Smelter is the predominant source of lead emissions in the area. Therefore, the RACM analysis focuses on sources within the plant.

Table 3 provides the results of the RACM analysis.

Table 3: Doe Run Glover, RACT/RACM Analysis

Description of Measure	Explanation	Used in Control Strategy
Pave, vegetate or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.	All primary traffic routes inside the plant have been paved.	Yes
Require dust control plans for construction or land clearing projects.	Such sources have not been identified in the emission inventory or modeling study as contributing to any measurable degree to ambient lead concentrations. Therefore, these types of sources are not addressed in the control strategy of the maintenance plan. Doe Run will perform such duties as determined necessary by MDNR on a project-by-project basis if there are future construction or land clearing activities planned.	No
Require haul trucks to be covered.	This measure is currently standard practice and will continue.	Yes
Provide for traffic rerouting around or rapid cleanup of temporary sources of dust on paved roads.	Currently Doe Run operates a sweeper that will quickly address spills of lead-bearing dust on paved roads. During cleanup, traffic will be rerouted around the spill area.	Yes
Develop traffic reduction plans for unpaved roads.	All primary traffic routes inside the plant have been paved.	Yes
Develop traffic reduction plans for unpaved roads.	Areas in the plant that are currently not paved remain unpaved because they are not routinely used.	No
Limit use of recreational vehicles on open land.	Recreational vehicles are not permitted in the Doe Run, Glover facility.	Yes
Require improved material specifications for and reduction of usage of skid control sand or salt.	Use of these materials is very limited in the Doe Run, Glover facility. These materials do not contain appreciable amounts of lead, and therefore, its control is not applicable to the control strategy	No

Description of Measure	Explanation	Used in Control Strateg y
Require curbing and pave or stabilize shoulders of paved roads.	All primary traffic routes inside the plant have been paved. Shoulders of roads in the plant have not been identified as sources of lead-bearing dust.	No
Pave or chemically stabilize unpaved roads.	All primary traffic routes inside the plant have been paved. A few areas will remain unpaved because they are seldom used, and this usage is not expected to increase.	Yes
Pave or chemically stabilize unpaved parking areas.	All primary traffic routes inside the plant have been paved. Parking areas are paved.	Yes
Require dust control measures for material storage piles.	Most of the lead-bearing storage piles are located inside buildings. Outside storage pile emissions have insignificant impacts on ambient lead impacts.	No
Provide stormwater drainage to prevent water erosion onto paved roads.	The Glover facility has a comprehensive stormwater and process water collection system that minimizes erosion of storage piles onto paved roads.	Yes
Require revegetation, chemical stabilization, or other abatement of wind erodible soil.	The emission inventory and dispersion modeling do not show wind erosion events as significant contributors of lead emissions at the Doe Run, Glover facility.	No
Rely upon the soil conservation requirements to reduce emissions from agricultural operations.	No agricultural operations involving soil disturbance occur at the Doe Run, Glover facility.	No

Pursuant to the 1990 CAAA, an analysis of RACT was performed as an element of the 1996 SIP revision. This analysis was performed to ensure that all controls are reasonably available and that all technologically and economically feasible controls were evaluated. This analysis was conducted according to EPA guidance published in 1992. Since no new emission controls are being identified in this exercise, the 1996 RACT analysis remains valid for this maintenance plan.

6.0 Contingency Measures

Pursuant to Section 172 of the CAAA, a set of contingency measures has been prepared that could be implemented if required by a finding of the EPA regional administrator that additional permanent emission controls will be necessary to protect the NAAQS. Additional emission control projects were identified as contingency measures such that they would be both effective and timely. Six contingency measures were identified, and a phased approach was chosen.

If the air quality for the calendar quarter following the approval of the maintenance plan, or any quarter thereafter, exceeds the NAAQS for lead, the first contingency measure shall be implemented within thirty days of notice from MDNR. If the lead standard is not achieved in the following quarter, contingency measures 2,3, and 4 shall be implemented within ninety days notice from MDNR. If the NAAQS has not been met after implementation of these additional control measures, then the remaining contingency measures shall be implemented within ninety days notice from MDNR.

Contingency Measures:

1.) Truck Wash at exit of Unloading Building.
2.) Expand In-Plant Road Sprinkler System.
3.) Withdraw Unloading Building air as make-up air for Sinter Plant.
4.) Doe Run shall meet the following stack emission limits: Main Stack – 160.1 pounds of lead per 24-hours; Ventilation Baghouse Stack – 108.9 pounds of lead per 24-hours; and Blast Furnace Stack – 71.5 pounds of lead per 24-hours.
5.) Modify refinery skims handling in the blast furnace area.
6.) Increase efficiency of Sinter Plant Ventilation Baghouse.

Doe Run has completed all of the planning and engineering work for these contingency measures, and will maintain current bids of the materials necessary to implement each of these measures.

If Doe Run identifies and demonstrates to the MDNR's satisfaction alternative control measure(s) that would achieve equal or greater air quality improvement than the contingency measure(s) identified above, Doe Run may substitute the new control(s).

7.0 Enforcement Conditions

In the 1996 SIP revision there were three documents that made the SIP controls state enforceable. These were the lead rule (*10 CSR 10-6.120 Restriction of Emissions of Lead from Specific Lead Smelter-Refinery Installations*), the consent decree, and the Work Practices Manual.

For the maintenance plan the individual enforcement requirements are being retained, but instead of being in three documents they are now being organized into a single settlement agreement made between Doe Run, MDNR, and the Missouri Air Conservation Commission. The settlement agreement, given in Appendix A, is a comprehensive document that sets out the responsibility of the parties and addresses the following major topics: 1) performance criteria and maintenance of emission control systems, 2) stack testing requirements, 3) process throughput limitations, 4) recordkeeping requirements, 5) contingency measures and schedule, 6) stipulated penalties for failure to meet obligations, and 7) dispute resolution.

Upon approval of the SIP, all of the enforceable conditions of the settlement agreement will become federally enforceable.

Legal authority for enforcement of the lead control strategy resides with the MACC under the existing Missouri Law RSMo 643 and the currently approved SIP.

Section 643.050.1(5), RSMo 1996, empowers the MACC to be the proper mechanism by which the Settlement Agreement is made. This Section provides that the MACC is empowered to:

> "Enter such order or determination as may be necessary to effectuate the purposes of sections 643.010 to 643.190. In making its orders and determinations hereunder, the commission shall exercise a sound discretion in weighing the equities involved and the advantages and disadvantages to the person involved and to those affected by air contaminants emitted by such person as set out in section 643.030. . . ."

The following sections of Missouri Law provide the enforcement condition authority to the MACC. These orders include requiring installation of equipment to reduce emission of air contaminants in order to attain and maintain the NAAQS for lead.

- Section 643.030, RSMo 1996, which provides that the discharge of air contaminants which cause or contribute to air pollution is contrary to the public policy and in violation of Chapter 643 RSMo.

- Section 643.190, RSMo 1996, which empowers the Air Conservation Commission to take all necessary or appropriate action to obtain the benefits of any federal air pollution control act

- Section 643.050.1(5) empowers the Air Conservation to issue orders necessary to effectuate approval of the SIP.

8.0 Conclusion

This document serves as the formal submittal to the Environmental Protection Agency (EPA) requesting the redesignation of the Glover nonattainment area. It includes documentation of air quality data showing that the area is in compliance with will continue to maintain the National Ambient Air Quality Standard (NAAQS) for lead.

This document also serves as the maintenance plan and includes an emission inventory, a maintenance demonstration, a set of permanent and enforceable emission control projects, and contingency measures. Future emissions are projected, and a modeling demonstration (Appendix B: Doe Run Glover Redesignation Request Dispersion Model Review) shows that there will not be an exceedance of the National Ambient Air Quality Standard (NAAQS) for lead. A Settlement Agreement (Appendix A) is being executed that will make all of the emission control projects required to maintain the air quality standard enforceable.

APPENDIX A

SETTLEMENT AGREEMENT

SETTLEMENT AGREEMENT

This Settlement Agreement is made by and among the Missouri Department of Natural Resources ("MDNR"), the Missouri Air Conservation Commission ("MACC"), and the Doe Run Company. This Settlement Agreement is made on the date this document is executed by MDNR.

WHEREAS, the State of Missouri is preparing a request to the Environmental Protection Agency to redesignate the Arcadia and Liberty Townships in Iron County, Missouri (Glover Nonattainment Area), as attainment for lead (Pb). This request is being developed in accordance with the requirements established in Section 107 (d) (2) of the 1990 Clean Air Act Amendments. As part of the submittal to the Environmental Protection Agency, the State of Missouri is preparing a Maintenance Plan.

WHEREAS, ambient air monitors located in the Glover Nonattainment Area have shown continuous compliance with the National Ambient Air Quality Standard for lead (Pb) beginning in the first calendar quarter of 1997.

WHEREAS, the Doe Run Company has agreed to continue operating the lead (Pb) emission control equipment and processes at the Glover Lead Smelting Facility as established in this Settlement Agreement. This program of lead (Pb) emission controls are required as part of the Maintenance Plan. The Maintenance Plan includes a technical demonstration that the National Ambient Air Quality Standard for lead (Pb) shall continue to be met.

NOW THEREFORE, in consideration of the mutual promises contained herein, the parties agree as follows:

1. The provisions of this Settlement Agreement shall apply to and be binding upon the parties executing this Settlement Agreement, their heirs, assignees, successors, agents,

subsidiaries, affiliates, and lessees, including the officers, agents, servants, corporations and any persons acting under, through, or for the parties agreeing hereto. The parties, by their signatures hereto, acknowledge that they have read and understand the terms of this Settlement Agreement and agree to be bound thereby.

This Settlement Agreement may be modified upon the mutual written agreement of Doe Run, MDNR, and the MACC. It is recognized that from time to time Doe Run or any subsequent operator of the Glover Smelter may change its operating processes and procedures. The parties further agree that this Settlement Agreement is an element of the Glover Lead Maintenance Plan and, as such, any modifications thereto must be approved by the U.S. Environmental Protection Agency before the Maintenance Plan can be modified.

2. This Settlement Agreement can be terminated only upon mutual written agreement of Doe Run, MDNR, and the MACC.

3. Doe Run agrees to continue the operation of a lead emissions control program as set forth below. This program is sufficient to maintain the National Ambient Air Quality Standard for lead (Pb) in the Glover Nonattainment Area.

A. Concentrate Unloading: All trucks delivering concentrate shall unload only at the unloading building. The unloading shall be conducted according to the procedures outlines in Doe Run's Work Practices Manual (Addendum A, which, by this reference is incorporated herein).

B. Unloading Building Fugitive Emissions: The siding, roll-up doors, and roof monitor enclosure, each constructed to minimize air infiltration into the unloading building, shall be maintained. These doors and all personnel access doors shall remain closed except as needed for employees or vehicles to enter or exit the building. The modified sinter handling system shall continue to be operated. This system shall convey sinter using the partially enclosed conveyor which deposits sinter directly into the feed hoppers such that a minimum of 70 percent of the sinter is deposited into the hoppers. When the hoppers are full, sinter shall be deposited into the unloading bins.

C. Sinter Plant Process Gas Controls: The ventilation gases exiting the Wheelabrator Baghouse and the Sinter Plant Wet Scrubber shall continue to be routed to the Sinter Machine intake. The Sinter Plant Process Gas Baghouse shall continue to service the sinter plant process gases. The Sinter Plant Process Gas Baghouse shall be maintained to meet a total suspended particle specification of 0.01 grains per dry standard cubic foot of air. Gases exiting the Sinter Plant Process Gas Baghouse shall continue to be routed to the 186 meter main stack. The continuous particulate monitor, or equivalent, shall continue to be operated to monitor gases exiting the Sinter Plant Process Gas Baghouse. This continuous particulate monitor shall be operated to alert operators when particulate levels in the monitored gases exceed those experienced during a normal bag cleaning cycle. The output signals from this continuous particulate monitor shall be recorded during any stack tests. The setpoint of the continuous particulate monitor shall be set and recalibrated as necessary as part of a quarterly ventilation system inspection required under the Work Practices Manual (Addendum A), subject to MDNR's right to review and approve such calibration of the monitors. The monitor shall be operated and properly maintained such that it is out of service for no more than 48 hours per each calendar quarter. All necessary spare parts shall be maintained on site to assure that an extended monitor outage does not occur. Doe Run shall provide MDNR with a quarterly report within 30 days of the end of each calendar quarter summarizing monitor setpoints, alarm incidents, and any corrective actions taken. The amperage of the Sinter Plant Process Gas Baghouse Fan shall be continuously recorded, and maintained above 125 amps except when systems are not being operated, during start-up or shutdown of the ventilation systems, during baghouse cleaning or repair, during cellar cleaning, or during maintenance, or during other conditions not representative of normal operating conditions. If any of these conditions apply, they shall be noted in the process logs, and reported MDNR on the quarterly report along with a summary of the fan amperage records. In addition, Doe Run shall measure at least once each calendar quarter the sinter process gas flowrates demonstrating that 125 amps continues to provide a minimum face velocity at building openings of 200 feet per minute.

D. Sinter Plant Building Ventilation and Fugitive Emission Controls. The siding and doors constructed to minimize air infiltration into the Sinter Plant Building shall be maintained. This enclosure shall continue to meet the criteria for permanent total enclosure as set forth in the U.S. Environmental Protection Agency's draft guidelines for determining capture efficiency (September 30, 1993). Sinter Plant doors shall remain closed except to allow for entering and exiting the building from the time of sinter machine start-up to 48 hours after sinter machine shutdown. Sinter Plant Building Ventilation Gases shall continue to be routed to the Sinter Plant Ventilation Baghouse. The Sinter Plant Ventilation Baghouse shall be maintained to meet a total suspended particulate specification of 0.01 grains per dry standard cubic foot of air. The continuous particulate monitor, or equivalent, shall continue to be operated to monitor gases exiting the Sinter Plant Ventilation Baghouse. This continuous particulate monitor shall be operated to alert operators when particulate levels in the monitored gases exceed those experienced during a normal bag cleaning cycle. The output signals from this continuous particulate monitor shall be recorded during any stack tests. The setpoint of the continuous particulate monitor shall be set and recalibrated as necessary as part of a quarterly ventilation system inspection required under the Work Practices Manual (Addendum A), subject to MDNR's right to review and approve such calibration of the monitors. The monitor shall be operated and properly maintained such that it is out of service for no more than 48 hours per each calendar quarter. All necessary spare parts shall be maintained on site to assure that an extended monitor outage does not occur. Doe Run shall provide MDNR with a quarterly report within 30 days of the end of each calendar quarter summarizing monitor setpoints, alarm incidents, and any corrective actions taken. The flowrate of the Sinter Plant Process Gas Baghouse Fan shall be maintained above 100,000 actual cubic feet per minute as measured by a vortex mass airflow transmitter except during start-ups or shut-downs, during baghouse cellar cleaning or repair, during maintenance, or during other conditions not representative of normal operating conditions. If any of these conditions apply, they shall be noted in the process logs, and reported MDNR on the quarterly report along with a summary of the transmitter records. Gases exiting the Sinter Plant Ventilation Baghouse shall be routed to the Sinter Plant Ventilation Stack. The conveyor from "R" hopper to the smooth rolls crusher shall continue to be maintained as a replacement for 3360 conveyor belt, 3250 pan conveyor, and the corrugated rolls crusher. The main feed conveyor shall continue to be maintained such that the drop point is extended to the mixing drum.

E. Blast Furnace Controls. The following ventilation hoods shall continue to be maintained: (i) Slag Launder Hood, (ii) Emergency Slag Opening Hood, and (iii) Lead

Pot Hood Modifications. The following ventilation rates to the furnace and dross kettle processes shall be maintained: (i) 60,000 actual cubic feet per minute from the top of the blast furnace, routed to the Blast Furnace Baghouse, (ii) 22,000 actual cubic feet per minute from the front of the blast furnace, routed to the Sinter Plant Ventilation Baghouse, (iii) 15,000 actual cubic feet per minute from the receiving kettles routed to the Blast Furnace Baghouse. These ventilation rates shall be measured at least quarterly, and maintained except during start-ups or shut-downs, during baghouse cellar cleaning or repair, during maintenance, when the source being ventilated is not in operation, or during conditions nonrepresentative of normal operations. The continuous particulate monitor, or equivalent, shall continue to be operated to monitor gases exiting the Blast Furnace Baghouse. This continuous particulate monitor shall be operated to alert operators when particulate levels in the monitored gases exceed those experienced during a normal bag cleaning cycle. The output signals from this continuous particulate monitor shall be recorded during any stack tests. The setpoint of the continuous particulate monitor shall be set and recalibrated as necessary as part of a quarterly ventilation system inspection required under the Work Practices Manual (Addendum A), subject to MDNR's right to review and approve such calibration of the monitors. The monitor shall be operated and properly maintained such that it is out of service for no more than 48 hours per each calendar quarter. All necessary spare parts shall be maintained on site to assure that an extended monitor outage does not occur. Doe Run shall provide MDNR with a quarterly report within 30 days of the end of each calendar quarter summarizing monitor setpoints, alarm incidents, and any corrective actions taken. If any of these conditions apply, they shall be noted in the process logs, and reported MDNR on the quarterly report. Gases exiting the Blast Furnace Baghouse shall be routed to the Blast Furnace Stack.

F. In-Plant Roads, Dust Control. The road watering system shall be maintained on operated, except when ambient temperatures fall below 39ºF. A map showing the coverage of the sprinkler system is included in Addendum A as Figure 3.1. The street sweeping program shall continue. Weather permitting, the sweeper shall be operated six hours per day, Monday through Friday, on all paved roadways within the plant that are not controlled by the water sprinkler system. The sweeper shall be operated to include those roadways controlled by the water sprinkler system when the ambient temperature is below 39ºF. Figure 3.1 in Addendum A also shows the paved area that is to be swept.

G. Stack Emission Limits. This installation shall limit lead emissions into the atmosphere to the allowable emissions as listed: Main Stack – 184.2 pounds of lead per 24 hours, Sinter Plant Ventilation Baghouse Stack – 125.4 pounds of lead per 24 hours, and Blast Furnace Stack – 82.3 pounds of lead per 24 hours. Compliance with the emission limitations shall be demonstrated through tests conducted at Doe Run's expense, by an independent testing firm approved by MDNR. Lead emission rates shall be determined in accordance with 40 CFR Part 60 Appendix A, Method 12, or alternative methods as proposed by the Doe Run and approved by MDNR. Testing shall be conducted by April 1, 2005, and every four years thereafter. Doe Run shall notify MDNR of the proposed test dates and provide a copy of the test protocol to MDNR at least 30 days before testing. Test reports, including raw data, shall be submitted to MDNR within 60 working days of the completion of stack sampling.

H. Limitation of Hours of Operation. Doe Run shall limit the hours of operation of the following sources as follows: (i) Blast Furnace Baghouse clean out shall be limited to no more than 8 hours, one day per week, to occur between 7:00 A.M. and 6:00 P.M., (ii) Sample Preparation Baghouse shall be limited to no more than 8 hours in any one day to occur between 7:00 A.M. and 6:00 P.M., and Laboratory Assay Vent shall be limited to no more than 8 hours in any one day to occur between 7:00 A.M. and 6:00 P.M.

I. Process Weight Limits. Sinter plant production shall be limited to 202,000 tons of material charged per each calendar quarter. Sinter plant production shall be limited to 3,120 tons of material charged per day (7:00 A.M. to 7:00 A.M.). Blast furnace production shall be limited to 75,000 tons of lead-bearing material charged per each calendar quarter.

J. Work Practice Manual. Doe Run shall, to the extent consistent with this Settlement Agreement, adhere to the Work Practices Manual (Addendum A). Work practices in the Work Practice Manual may be modified only with the prior written approval of MDNR.

K. Record-Keeping. Doe Run shall maintain the following records for MDNR review for a minimum of 5 years following the recording of information. Doe Run shall maintain a file that states for each shift; (i) Sinter Machine throughput, (ii) Blast Furnace throughput, (iii) and refined lead produced. Doe Run shall maintain a file of the date, time, findings, and corrective actions taken for all baghouse inspections scheduled in the Work Practices Manual. Doe Run shall maintain a file that records any upset operating conditions or material spills that affect lead emissions. Doe Run shall maintain a file that includes the following information involving street sweeping and the road sprinkler system: (i) Sweeper hours of operation, (ii) Reasons for not conducting sweeping on any occasion, (iii) Sweeper maintenance records, including dates of brush and filter replacement, and (iv) Reason for not operating the road sprinklers on any occasion. Doe Run shall maintain a file that records the weekly inspection of the conditions of the doors and siding of the unloading and Sinter Plant Buildings. Pending resolution of any enforcement action initiated by MDNR, Doe Run shall maintain all pertinent records indefinitely. Doe Run shall report to MDNR any property transfers related to the Glover facility, both sales and acquisitions, within ninety days.

L. MDNR and Doe Run shall continue monitoring the air for lead at all current monitor locations and frequencies and share all collected data. MDNR, with assistance from Doe Run, shall review the monitoring network by December 31, 2004, and changes, if any, to the monitoring frequency and locations shall be made as a result of this review.

M. Fencing. Doe Run shall continue to maintain a fence that precludes public access to areas that the Maintenance Plan modeling indicates will have lead concentrations above the National Ambient Air Quality Standard for lead (Pb).

N. Contingency Measures. If any air monitor in the area exceeds the lead standard as specified in 40 CFR 50.12, MDNR shall notify Doe Run. Implementation of the following contingency measures shall begin within 30 days from receipt of MDNR's notice, according to the following schedule. Contingency measure number (i) shall be implemented within 30 days from receipt of MDNR's original notice. If the lead standard is not achieved in the quarter following implementation of contingency measure (i), then contingency measures (ii), (iii), and (iv) shall be implemented in the next quarter. If the lead standard is not achieved in the quarter following implementation of contingency measures (ii), (iii), and (iv), then contingency measures (v), (vi), and (vii) shall be implemented in the next quarter.

Contingency Measures:

(i) Truck Wash.

(ii) Expand In-Plant Road Sprinkler System.

(iii) Withdraw Unloading Building air for Sinter Plant Make-up air.

(iv) Doe Run shall meet the following stack emission limits: Main Stack – 160.1 pounds of lead per 24 hours, Ventilation Baghouse Stack – 108.9 pounds of lead per 24 hours, and Blast Furnace Stack – 71.5 pounds of lead per 24 hours. Compliance with these contingency stack emissions limitations shall be demonstrated to MDNR by Doe Run through tests conducted at Doe Run's expense, by an independent testing firm approved by MDNR. Lead emission rates shall be determined in accordance with 40 CFR Part 60 Appendix A, Method 12, or alternative methods as proposed by Doe Run and approved by MDNR. Contingency stack testing shall be conducted within 30 days of notification from MDNR. Test reports, including raw data, shall be submitted to MDNR within sixty working days of the completion of the stack sampling.

(v) Modify refinery skims handling in blast furnace area.

(vi) Increase efficiency of Sinter Plant Ventilation Baghouse.

Doe Run shall maintain current bids on the materials necessary to implement each of these contingency measures. If Doe Run identifies and demonstrates to MDNR's satisfaction alternative control measure(s) that would achieve equal or greater air quality improvements than the contingency measures identified above, MDNR agrees that Doe Run may substitute the new control(s) for the contingency measure(s) identified above. The substitute contingency measure shall be implemented under the same time frame as the original measure, unless both parties agree to a modified contingency schedule.

O. Stipulated Penalties. If Doe Run fails to comply with any requirement of this Settlement Agreement, Doe Run shall pay stipulated penalties according to the following schedule. The penalties set forth below are per day penalties, which are to be assessed beginning with the first day of the violation.

Period Of Noncompliance	Penalty
1st through 30th day	$ 500.00
31st though 60th day	$1,000.00
Beyond 61 days	$1,500.00

All penalties shall be paid within 45 days of the date of notice of noncompliance unless the penalty is challenged by Doe Run pursuant to the Dispute Resolution procedure outlined in Paragraph P. If the penalty is challenged, it shall not be paid until 30 days after the Director's determination that Doe Run owes the stipulated penalty, and Doe Run has failed to use, or has exhausted, its rights to review the Director's Decision. Stipulated penalties shall continue to accrue during the formal Dispute Resolution process or any appeal. In the event that Doe Run prevails, stipulated penalties shall not be due or owed. All penalties shall be paid by certified check made payable to the Iron

County Treasurer as Trustee for the Iron county School Fund, and delivered to the Attorney General of Missouri, P.O. Box 899, Jefferson city, Missouri 65102-0899, Attention: Shelley A. Woods, Assistant Attorney General, or Designee.

The penalties set forth herein shall not apply in the event of a force majeure, as defined in this paragraph. For the purposes of this Settlement Agreement, force majeure shall be defined as any event arising from causes beyond the control of Doe Run and of any entity controlled by Doe Run that delays or interferes with the performance of any obligation under this Settlement Agreement notwithstanding Doe Run's best efforts to avoid such an event. The requirement that Doe Run exercise "best efforts to avoid such an event" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any potential force majeure event (1) as it is occurring, and (2) following the potential force majeure event such that the adverse effect or delay is minimized to the greatest extent practicable. Examples of events that are not force majeure events include, but are not limited to, increased cost or expenses of any work required under this Settlement Agreement or the financial difficulty of Doe Run to perform such work.

If any event occurs that is likely to delay or interfere with the performance of an obligation under this Settlement Agreement, whether or not caused by a force majeure event, Doe Run shall notify MDNR by telephone within 72 hours if Doe run knows the event is likely to delay or interfere with performance of an obligation under this Settlement Agreement. Within 5 business days thereafter, Doe Run shall provide in writing the reasons for the event; the anticipated duration; all actions taken or to be taken to minimize its effects; a schedule for implementation of any measures to be taken to mitigate the event; and a statement as to whether, in the opinion of Doe Run, such an event may cause or contribute to the endangerment of public health, public welfare, or the environment. Failure to comply with the substance of the above requirements shall preclude Doe Run from asserting any claim of force majeure.

If MDNR agrees that the failure to perform an obligation of this Settlement Agreement is attributable to a force majeure, then the time for performance of any obligation under this Settlement Agreement that is directly affected by the force majeure event shall be extended for a period of time not to exceed the actual duration of the delay caused by the force majeure event.

If MDNR does not agree that the delay or noncompliance has been or will be caused by a force majeure event, or does not agree with Doe Run on the length of any time extension, the issue shall be subject to the Dispute Resolution procedures set forth in Paragraph P of this Settlement Agreement. In any such proceeding, to qualify for force majeure defense Doe Run shall have the burden of demonstrating by a preponderance of the evidence that the delay or noncompliance has been or will be caused by a force majeure event, that its duration was or will be warranted under the circumstances, that Doe Run exercised or is exercising due diligence by using its best efforts to avoid and mitigate its effects, and that Doe Run complied with the notification requirements in this section (Section O.) Should Doe run carry the burden set forth in this paragraph, the delay or noncompliance at issue shall be deemed not to be a violation of the affected obligation of this Settlement Agreement.

MDNR agrees that the stipulated penalties set forth herein shall be MDNR's sole and exclusive remedy for any alleged or actual noncompliance by Doe Run with any terms of requirements of this Settlement Agreement or of the Work Practices Manual (Addendum A). MDNR waives its right to seek additional penalties under § 643.151, RSMo or any other provision of law for any such noncompliance.

Upon request of Doe Run, MDNR may in its unreviewable discretion impose a lesser penalty or no penalty at all for violations subject to stipulated penalties.

P. Dispute Resolution. Any dispute, which arises with respect to the meaning, application or implementation of this Settlement Agreement, shall in the first instance be the subject of informal negotiations between Doe Run and MDNR. Notice of a dispute shall be given by the party alleging the dispute, shall be addressed in writing to the MDNR Director, and copied to the opposing party. Such notice shall state the specific grounds for the dispute, including any supporting documentation, and the relief requested.

The MDNR and Doe run shall have 30 days from the receipt of the notice of the dispute to resolve the dispute. If agreement is reached, the resolution shall be reduced to writing and this Settlement Agreement modified, if appropriate. If the MDNR and Doe Run are unable to reach complete agreement within the 30-day period and this period is not extended in writing by mutual agreement of the parties, the matter will be submitted to the Director. The opposing party may file suggestions in opposition and include any documentation relevant to deciding the dispute. Said suggestions and documentation shall be submitted within 14 days of submission of the matter to the Director. The MDNR Director will issue a written decision following his/her review of the record submitted by the parties.

The parties will then be entitled to judicial review pursuant to Section 536.140, RSMo. The filing of a notice of dispute shall not automatically suspend or postpone any parties' obligations under this Settlement Agreement with respect to the disputed issue. This provision shall not be construed to prevent either party from requesting a stay of the party's obligations under this Settlement Agreement, which request shall be filed at the same time as the notice of dispute.

IN WITNESS WHEREOF, the parties have executed this Settlement Agreement as follows:

MISSOURI DEPARTMENT OF NATURAL RESOURCES

By: ____________________________

Ms. Leanne Tippet
Director
Air Pollution Control Program

Date: ____________________________

DOE RUN COMPANY

By: ____________________________

Name
Title
Doe Run Company

Date: ____________________________

MISSOURI AIR CONSERVATION COMMISSION

By: ____________________________

Ms. Barry Kayes
Chair
Missouri Air Conservation Commission

Date: ____________________________

ADDENDUM A

Manual of Work Practices

for Control of Lead Emissions

Table of Contents

1.0 Introduction

This manual of work practices has been revised in support of the maintenance plan for the control of lead emissions in the Glover, Missouri area. The ASARCO Incorporated Primary Lead Smelter and Refinery is the principal source of lead emissions in this area. These work practices are intended to minimize fugitive emissions of lead.

These work practices reflect process and equipment changes that will be made be part of the selected control strategy to reduce overall lead emissions.

1.1 Regulatory Requirements

This Manual is written to comply with the requirements of the Glover lead (Pb) maintenance plan. This manual is an Addendum to a Settlement Agreement between the Missouri Air Conservation Commission, the Missouri Department of Natural Resources and the Doe Run Company, and is the mechanism by which the work practices established in this manual become enforceable.

1.2 Definitions

Accumulated materials:	Lead bearing particulate that has the potential to become reentrained.
Washdown:	To wet or reduce accumulated materials.
Wetting:	Addition of sufficient water to ensure no visible emissions immediately following washdown.

2.0 Description of Operations

The operations of the various departments of the ASARCO Glover Plant are described below.

2.1 Concentrate Unloading

The primary feedstock for the Glover Plant is lead concentrate from local mines. The concentrate is approximately 78% lead in the sulfide form. The concentrate is delivered by semi-trucks.

The semi-trucks enter the North end of the Plant and are weighed. The trucks then proceed to the North end of the Unloading Building where they dump the concentrate directly into a hopper.

Other non-lead-bearing feedstock materials are received in similar fashion by truck or railcar.

An overhead bucket crane in the Unloading Building transfers the concentrate and other feedstock materials in to hoppers that proportionately deposit material onto conveyors that enter the Sinter Plant.

2.2 Sinter Plant

The sulfur in the lead concentrate is thermally removed in the sintering process. The concentrate is mixed in proportion with other feedstock materials such as silica, iron ore, and limestone fluxes. These materials are crushed and mixed prior to being deposited on the sinter machine conveyor with returned sinter and blast furnace slag through the mixing drum.

An ignition layer enters the sinter machine and is ignited by gas-fired burners. The main layer is laid down over the ignition layer. This complete feed bed enters the updraft portion of the machine that draws air across the sinter bed from bottom to top to drive the thermal reaction. The off-gases are collected in a hood covering the machine and directed to a process gas baghouse.

The product of this process is a lava-like material called sinter. The sinter is broken into various sizes and sorted by size. The larger pieces are transferred to the Unloading Building via conveyors. The undersized pieces are returned to the sinter machine feed after crushing. Approximately 50% of the sinter machine feed is undersized material.

2.3 Blast Furnace

The sinter from the Sinter Plant is directly deposited in one of three proportioning hoppers in the Unloading Building five days per week. These hoppers feed the "charge car" which contains the feedstock materials that charge the Blast Furnace. Some sinter is deposited in a large storage bin in the Unloading Building, typically on weekend days to provide reserve sinter that can be added to the hoppers by the overhead crane during times when the Sinter Plant is not operating.

The charge car is lifted to the top of the operating Blast Furnace and its contents are dumped into the furnace. The furnace shaft is fed from the top. Inside the shaft, the sinter is reduced by air and coke to form molten lead bullion. The flux materials form slag.

The bullion and slag are continuously tapped from the front of the furnace into a brick-lined settler where they are separated by gravity. The bullion is tapped into covered pots. The slag is generally granulated with water, cooled, and transported by conveyor belt to the Sinter Plant where it is recycled. Approximately one-third of the granulated slag is transported by truck and dumped onto the slag pile. During the infrequent times when the granulation system is not operational, the slag is tapped into pots, transported, and dumped onto the floor to cool. The cooled slag is then hauled to the slag pile.

The pots of bullion are lifted by an overhead crane and dumped into receiving kettles. As the bullion cools, a copper dross floats to the surface. Periodically, this dross is removed by skimming.

After the dross has been removed, the rough-drossed bullion is transported by ladle to the Refinery.

2.4 Refinery and Molding

The lead bullion from the receiving kettles is further refined by the removal of copper, silver, zinc, and other trace impurities. These refining steps are performed in kettles and involve the addition of various reagents. Most of the processes are conducted at a temperature just above the melting point of lead and consequently, emissions are minimal.

The refined lead is pumped to the molding department where it is molded into sizes and shapes requested by customers.

The molded lead is primarily shipped from the plant in semi-trucks although some is shipped by rail.

3.0 Work Practices for the Control of Fugitive Lead Emissions

These work practices are intended to inform employees of pre-established procedures that will minimize fugitive lead emissions caused from such activities as materials handling and maximize the effectiveness and longevity of installed fugitive emissions control equipment.

Maintenance activities in the Glover Plant are requested with a computer-based Work Order system. The Work Orders are ranked in descending priority from "Priority 1" through "Priority 6". Following is a description of the priority levels:

Priority 1 - Needs immediate attention;
Priority 2 - Needs to be completed within 7 days;
Priority 3 - Routine planned work;
Priority 4 - Downtime work;
Priority 5 - Preventive maintenance; and
Priority 6 - Downtime immediate action.

Records maintained pursuant to this Manual of Work Practices will be retained for five years by the party responsible for their completion or in a central ASARCO file. All records maintained pursuant to this manual will require the initials or signature of the person filling out the record form.

The Environmental department will keep a record of upsets in the plant that lead to unexpected lead emissions. An example of this would be spills of lead bearing material. This environmental incident report will note the duration, possible cause, estimates of emissions, and detail any corrective actions taken to correct the situation. A form for this purpose is given in Supplement A.

3.1 Concentrate Unloading

The primary control of fugitive lead emissions in this department is accomplished by the enclosed sides of the Unloading Building. The enclosed walls and doors prevent wind from entering the building and subsequently transporting lead-bearing dust out of the building. The dust is generated by material handling and dumping activities inside the building.

The applicable work practices supporting emissions controls focus on maintaining enclosed conditions for the Unloading Building.

3.1.1 Keeping Building Doors Closed During Material Handling Operations

Numerous roll-up doors will be installed to allow truck, railcar, front-end loader, and other vehicle access to the bins. The doors will be closed except during dumping from trucks and/or front-end loaders into storage bins. The doors will only be open during the dumping phase and will be closed immediately after dumping.

The exception to this practice is the unloading of baghouse dust. This dust must be dumped into a storage bin through a door on the West side of the building. The door will be immediately closed after a cellar is cleaned and all dust transported to the bin.

3.1.2 Maintenance of Doors and Siding

All doors and siding will be inspected regularly and repaired promptly.

The Unloading Supervisor will inspect the condition of the doors and siding once per week. If holes or openings are found in the doors or siding, repairs will be completed within 7 days of detection.

If a door is found that cannot be fully closed, either during the weekly inspection or during normal work, the door will be immediately corrected so that it will close. The door will not be opened during operations until it has been repaired to allow normal opening and closing.

The Unloading Supervisor will keep records of the weekly inspections using a form found in Supplement A.

3.2 Sinter Plant

Control of fugitive lead emissions in this department requires the effective enclosure and ventilation of the Sinter Plant. Lead dust inside the Sinter Plant is generated by the movement of materials and by the sintering machine itself. The applicable work practices that support these emission controls focus on maintaining enclosed conditions and maintaining proper building ventilation.

3.2.1 Keeping Building Doors Closed

The doors to the Sinter Building will be closed except when people or equipment are entering or exiting the building.

3.2.2 Maintenance of Doors and Siding

All doors and siding will be inspected regularly and repaired promptly.

The Sinter Plant Supervisor will inspect the condition of the doors and siding once per week. If holes or openings are found in the doors or siding, repairs will be completed within 7 days of detection.

The Sinter Plant Supervisor will keep records of the weekly inspections using a form found in Supplement A.

3.2.3 Sinter Building Washdown

Material spilled onto the lower floor will be collected and returned to the process using hoses and front-end loaders. Washdown will be performed once per day at a minimum when the ambient temperature is above 39°F. Washdown activities will be noted on sinter process logs.

3.2.4 Sinter Building Ventilation

Operation of the sinter machine will be initiated only if the Sinter Building ventilation is operating. Sinter Building ventilation will be operated for at least 48 hours after the shutdown of the sinter machine.

The ventilation system will undergo quarterly inspections as described in Supplement B.

3.3 Blast Furnace Area

3.3.1 Filling of Bullion Pots

Blast furnace employees will be trained in work practices to avoid overfilling of lead pots.

3.3.2 Use of Point Source Ventilation Systems

The point source ventilation systems for the blast furnace area include: 1) the front of the furnace and tapping area; 2) the receiving (dross) kettles; and 3) the top of the furnace.

Operation of a blast furnace and the associated bullion and slag tapping, kettle bullion transfers; or treatment in the dross kettles will be initiated only if the appurtenant point source ventilation systems are operable.

The processes of the blast furnace area are initiated by a large increase in temperature that begins a self-sustaining, continuous process. Once initiated, these processes cannot be stopped immediately and must wait for the temperature of the system to slowly drop below a level where the self sustaining portion of the process begins to diminish. If during operation excessive emissions are seen, the applicable point source ventilation system will be inspected immediately. Based on the inspection the next course of action will be chosen. This could include one of the following options: 1) reduce the blast furnace processes as much as possible to minimize excess emissions; 2) provide alternate ventilation; or 3) begin complete cessation of the blast furnace operations.

A Work Order of appropriate "Priority" status will be submitted to coordinate with the course of action chosen.

3.3.3 Periodic Inspection of Point Source Ventilation Systems

The point source ventilation systems in the blast furnace area will undergo quarterly inspections as described in Supplement B.

Records will be kept of these system inspections on a form found in Supplement A.

3.3.4 Prevention and Response to Blow Holes

The blast furnace operators will ensure that enough feed material is in the furnace to provide a sufficient seal at the top of the furnace.

If a blow hole should occur, prompt action will be taken to seal the hole.

This action could include shooting the area around the hole with explosives or adding additional feed material.

Blow hole occurrences and the corrective actions taken will be recorded on the Blast Furnace Daily Log Sheet by the supervisor in charge, after the condition has been corrected.

3.3.5 Execution of Sodium Treatment

Liquid sodium will be injected below the surface of the bath to prevent excess emissions.

3.3.6 Refinery Area Washdown

Material spilled onto the floor will be collected and returned to the process using hoses and front-end loaders. Washdown will be performed once per day at a minimum. Washdown activities will be noted on refinery process logs. For safety reasons, washdown will not be performed if the temperature is below 39°F.

3.4 In-Plant Roads

The In-plant roads are illustrated in Figure 3-1. A combination of sprinkling and sweeping will be used, as needed to minimize road dust.

3.4.1 Sprinkler Systems

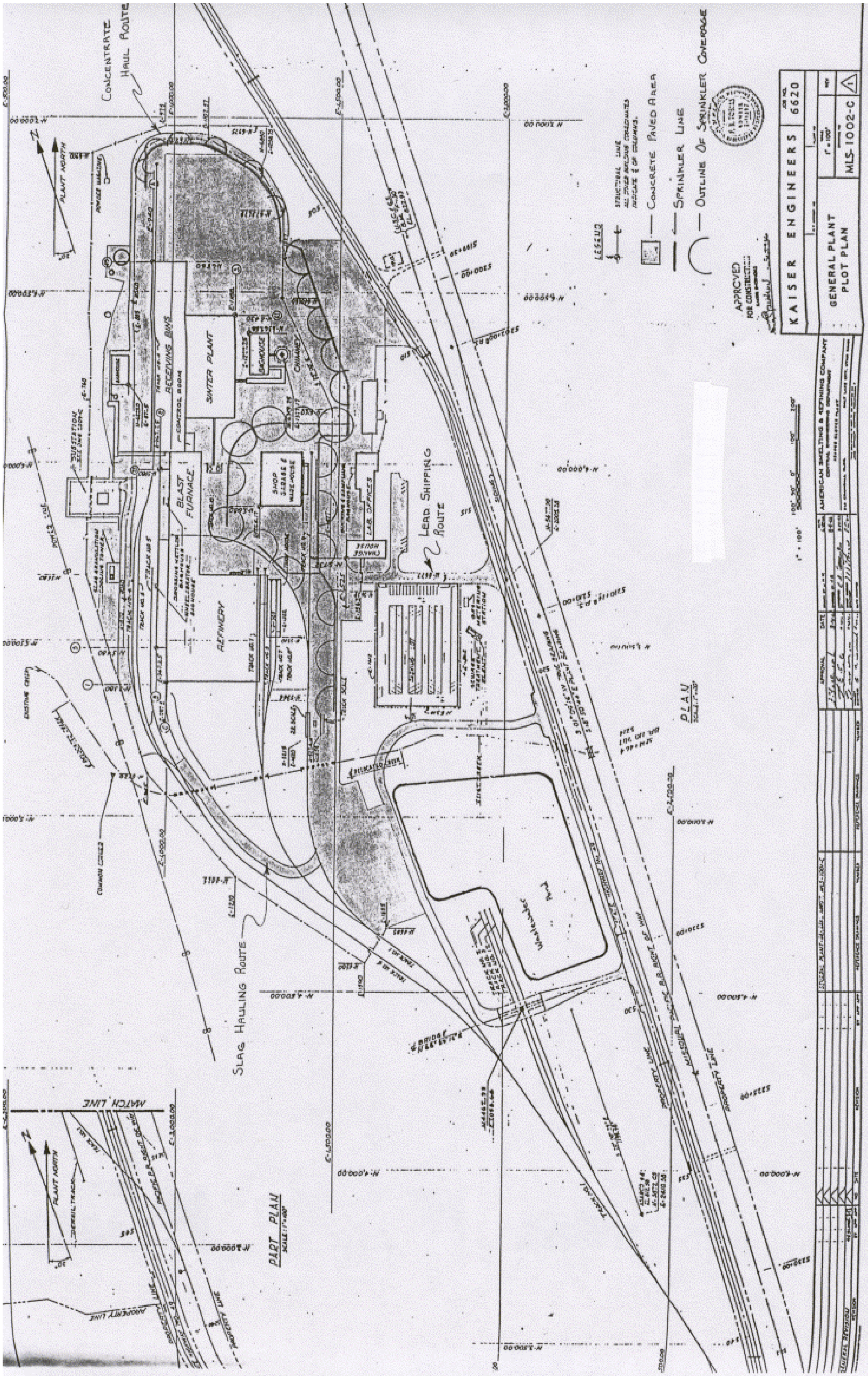
The traffic routes controlled by sprinklers are identified in Figure 3-1. These sprinkler systems will be maintained in proper working condition. Systems will be operated when the ambient temperature is above 39°F.

The systems will be inspected once per day by the Environmental Department. Records of the daily inspections will be kept in the Environmental Daily Log.

If a sprinkler system is providing less than full coverage of a traffic route through which vehicles drive, the following actions will be taken: 1) that section of the system will be inspected to determine the possible cause of the malfunction; 2) a "Priority 3" Work Order will be submitted; 3) all traffic will be routed around the area not covered until a) an alternate sprinkler/wetting system is setup or b) the area is dried and vacuum swept to a condition where minimal visible dust exists.

Records of the corrective actions taken will be kept in the Environmental Daily Log.

Figure 3-1



CONCENTRATE HAUL ROUTE
PLANT NORTH
RECEIVING BINS
SINTER PLANT
BAGHOUSE
CHIMNEY
BLAST FURNACE
SHOP STORES & WAREHOUSE
LAB OFFICES
CHANGE HOUSE
LEAD SHIPPING ROUTE
REFINERY
Wastewater Pond
SLAG HAULING ROUTE
COMMON CORNER
MATCH LINE
PLANT NORTH
PART PLAN
PLAN
PROPERTY LINE
LEGEND
CONCRETE PAVED AREA
SPRINKLER LINE
OUTLINE OF SPRINKLER COVERAGE
APPROVED FOR CONSTRUCTION
KAISER ENGINEERS
6620
GENERAL PLANT PLOT PLAN
MLS-1002-C
AMERICAN SMELTING & REFINING COMPANY

3.4.2 Road Sweeping

The In-plant roads will be swept as needed to minimize dust loading and during times when sprinkler system cannot be operated, such as during periods when the ambient temperature is below 39°F or during a malfunction of a sprinkler system section as described above. The areas controlled by sweeping are identified in Figure 3-1.

The sweeper will be operated according to the following schedule on a five days per week, six hours per day basis.

1. The concentrate truck unloading road will be swept a minimum of three times per day.

2. The refined lead truck road from the plant entrance to the refined lead loading area to the plant scale will be swept three times per day.

3. The slag haulage road from the plant scale to the rear plant entrance will be swept once per day.

4. The area between the maintenance shop and the blast furnace baghouse will be swept once per week. Additional sweeping will be done if visible suspended emissions exist in the area.

5. The area between the unloading building and the blast furnace baghouse will be swept twice per week. Additional sweeping will be done if visible suspended emissions exist in this area.

The sweeper will be operated and maintained according to the manufacturer's recommendations as provided in Supplement C.

3.5 Baghouse Cleaning

The objective of this procedure is to minimize, control, and prevent the escape of fugitive dust during the removal, transportation, and unloading of Sinter Plant Ventilation and Blast Furnace baghouse dust. The procedures are similar for each baghouse.

The Sinter Plant supervisor shall be responsible for assuring that baghouse dust unloading is conducted according to this procedure. The supervisor is responsible for training the hourly employees in the proper procedures. The supervisor shall inspect any baghouse dust unloading operation to ensure the procedures are followed. The supervisor shall be responsible for a log of all cellar cleaning activity.

Consideration should be given to wind. Windy conditions can lead to significant lead emissions during baghouse dust transport. Baghouse cleaning will not be done if the Sinter Plant supervisor feels that the local wind conditions would cause visible emissions.

Two employees shall perform the unloading procedure: a front-end loader operator and a baghouseman who operates the high pressure water hose and acts as a safety man.

A front-end loader is used to clean the cellars and transport the dust. The plant dump truck may be used on occasion to transport the dust.

The following steps are taken:

1) The damper is closed on the cellar to be cleaned;

2) Airborne dust is allowed to settle;

3) The main access door to the cellar is opened and the hose inserted to wet the dust as much as practical;

4) As the payloader cleans the cellar the baghouseman continues to wet the dust;

5) The dust is transported to the Unloading Building and dropped into the storage bin at as low level as possible to minimize the drop of the dust;

6) When the cellar is cleaned, the cellar door is resealed and the chamber put back in service by opening the damper. The roll-up door at the Unloading Building bin will be closed;

7) The doors are checked for leaks and corrected as necessary;

8) The area is cleaned by washing down with the hose and picking up

any material with the payloader.

9) The area is to be kept clean with a vacuum sweeper as required.

3.6 Baghouse Inspections

The baghouses are designed to filter particulate from ventilation and process gas streams. The purpose of baghouse inspections and baghouse particulate alarms is to ensure that the baghouses are operating properly, and to identify problems that can be corrected.

All baghouses will be inspected weekly for leaks using visual methods. The baghouse supervisor will be responsible for these inspections. Records of these inspections will be kept. If the weekly baghouse inspection indicates a problem with the baghouse, appropriate corrective action will be taken. The corrective actions will be noted on the inspection forms.

The baghouses will be inspected quarterly employing Visolite® tests according to the procedure in Supplement D. The baghouse supervisor will be responsible for these inspections. Records of these inspections will be kept.

Continuous particulate monitors will be operated whenever the Blast Furnace, Sinter Process, or Sinter Building Ventilation Baghouses are operated. If the signal from the continuous particulate monitor exceeds the output observed during a normal cleaning cycle, the alarm will sound.

If a baghouse alarm sounds, the following actions will be taken:

1. The baghouse operator will attempt to identify the cause of the alarms. This may mean locking out different cells in the baghouse and noting the output signal of the particulate monitor.

2. If the problem is identified, an appropriate work order will be submitted. Until corrective action has been taken, the baghouse will be operated such that lead emissions are minimized.

3. If the problem could not be immediately identified, the problem will be reported to the environmental department for further review. This

review will include a complete baghouse inspection.

4. All alarms and corrective actions will be noted on an inspection form and filed for future reference.

4.0 Training

Training will be given to the plant employees that will communicate the purpose and requirements of this Manual of Work Practices.

Operation guidelines, their rationale, and their effects on minimizing fugitive lead emissions will be stressed in this training.

The training will be part of the annual training module given to each Glover Plant employee. New employees also receive this training. Employees transferred into specialized areas will receive training for their new area.

Specialized training will be the responsibility of the area supervisor. General training of this Manual will be the responsibility of the Environmental Department. Training records will be kept in the plant safety office.

Specialized training is provided for the following job classifications:

★ Baghouseman
★ Sweeper operator
★ Charge car operator
★ Furnaceman
★ Drossman

Supplement A

Recordkeeping Forms

ASARCO INC, MISSOURI LEAD DIVISION, GLOVER UNIT

ENVIRONMENTAL INCIDENT REPORT

DATE:________________ LOCAL TIME:____________ SKY COVER:_____________

GROUND COND(WET,DRY,ETC):___________ DURATION:_________ INTENSITY:_________

DESCRIBE INCIDENT IN DETAIL:____

AREA SUPERVISOR ON DUTY:______________________ CORRECTIVE ACTION:_________

SIGNATURE OF ENVIRONMENTAL SPECIALIST:_______________________________

UNLOADING BUILDING ENCLOSURE INSPECTION

DATE: ____________

	OK	NEEDS REPAIR	DESCRIPTION OF PROBLEM	CORRECTIVE ACTION	DATE W/O WRITTEN	DATE COMPLETED
SIDING CONDITION						
DOORS:						
DOOR #:						
1						
2						
3						
4						
5						
6						
7						
8						

INSPECTED BY: ____________________

DAILY BAG-HOUSE REPORT

Date:________

Sinter Plant

	1	2	3	4	5	6	7	8	9
Cellars fired									
Bags: Replaced									
Retied									
Capped									
Dust Removed (Cat Buckets)									
Dampers working: Inlet									
Outlet									
Shakers Working									

Any Defects Noted:

Quality Visolite Test Results:

Spray Chamber	
No. of sprays cleaned	
Spray Temp. Control	
Baghouse Temp. Control	

Blast Furnace

	1	2	3	4	5	6
Cellars fired						
Bags: Replaced						
Retied						
Capped						
Dust Removed (Cat Buckets)						
Dampers working: Inlet						
Outlet						
Shakers Working						

Please note the cause of any problems which occured in the last 24 hours, and any corrective action taken. When bags fail, describe as accurately as possible the location (top, middle, bottom; seam, bell, etc.)of the failure and possible cause.

Any Defects Noted:

Quality Visolite Test Results:

Spray Chamber	
No. of sprays cleaned	
Spray Temp. Control	
Baghouse Temp. Control	

ASARCO GLOVER PLANT PROCESS BAGHOUSE INSPECTION SHEET

BAGHOUSE: ______________________ DATE: ____________

INSPECTOR: ______________________ TIME: ____________

CELL	MAGNEHELIC: GOOD	MAGNEHELIC: NEEDS ATTN:	DIAPHRAM: GOOD	DIAPHRAM: NEEDS ATTN:	TIME SETTING: GOOD	TIME SETTING: NEEDS ATTN:	BAGS: GOOD	BAGS: NEEDS ATTN:
1	( )	( )	( )	( )	( )	( )	( )	( )
2	( )	( )	( )	( )	( )	( )	( )	( )
3	( )	( )	( )	( )	( )	( )	( )	( )
4	( )	( )	( )	( )	( )	( )	( )	( )
5	( )	( )	( )	( )	( )	( )	( )	( )
6	( )	( )	( )	( )	( )	( )		

	GOOD	NEEDS ATTN:
FAN AMPS: ____________	( )	( )
AIR PRESSURE	( )	( )
SOLENOID VALVES	( )	( )

CORRECTIVE ACTION TAKEN: ______________________

____

____

DATE: ____________

BAG FAILURE	TOP	MIDDLE	BOTTOM
( ) TEARS	( )	( )	( )
( ) TORN SEAMS	( )	( )	( )
( ) PIN HOLES	( )	( )	( )

WHICH CELL: ____________

NO. BAGS REPLACED: ____________

CORRECTIVE ACTION TAKEN:

____

____

____

____

DATE: ____________

CAGE CONDITION: BENT: ________ BROKEN: ________ TIME: ________

CELL #: ________ NUMBER OF CAGES: ________ DATE: ________

WEEKLY MAGNAHELIC READINGS

CELL #	MON	TUES	WED	THUR	FRI	SAT	SUN
1							
2							
3							
4							
5							
6							

QUARTERLY VISOLITE TEST:

DATE: ____________

RESULTS: ______________________

CORRECTIVE ACTION TAKEN:

____

____

____

SINTER BUILDING ENCLOSURE INSPECTION

DATE: ______________

	OK	NEEDS REPAIR	DESCRIPTION OF PROBLEM	CORRECTIVE ACTION	DATE W/O WRITTEN	DATE COMPLETED
SIDING CONDITION						
DOORS:						
DOOR #:						
1						
2						
3						
4						
5						
6						
7						
8						

INSPECTED BY: ______________________________

POINT SOURCE VENTILATION SYSTEMS QUARTERLY INSPECTION REPORT

DATE: ____________

BLAST FURNACE AREA PSV SYSTEMS	MINIMUM REQUIRED AIR FLOW ACFM	ACTUAL ACFM	VISUAL INSPECTION MECHANICAL & PHYSICAL CONDITION		W/O	DEFICIENCY	CORRECTIVE ACTION	DATE COMP.
			OK	NEEDS REPAIR				
1. FRONT OF FURNACE & TAPPING AREA	22,000							
2. RECEIVING KETTLES	15,000							
3. TOP OF FURNACE	60,000							

SINTER BUILDING PSV SYSTEMS	MINIMUM REQUIRED AIR FLOW ACFM	ACTUAL ACFM	VISUAL INSPECTION MECHANICAL & PHYSICAL CONDITION		W/O	DEFICIENCY	CORRECTIVE ACTION	DATE COMP.
			OK	NEEDS REPAIR				
1. PROCESS GASES	185,000							
2. SINTER BUILDING VENTILATION	100,000							

INSPECTOR: ______________________________

ASARCO GLOVER PLANT WHEELABRATOR BAGHOUSE INSPECTION SHEET

BAGHOUSE: ______________________ DATE: ______________
TIME: ______________

INSPECTOR: ______________________

CELL	MAGNEHELIC GOOD	MAGNEHELIC NEEDS ATTN:	DIAPHRAM GOOD	DIAPHRAM NEEDS ATTN:	TIME SETTING GOOD	TIME SETTING NEEDS ATTN:	BAGS GOOD	BAGS NEEDS ATTN:
1	( )	( )	( )	( )	( )	( )	( )	( )
2	( )	( )	( )	( )	( )	( )	( )	( )
3	( )	( )	( )	( )	( )	( )	( )	( )
4	( )	( )	( )	( )	( )	( )	( )	( )
5	( )	( )	( )	( )	( )	( )	( )	( )

	GOOD	NEEDS ATTN:
AMPS 3906 FAN	( )	( )
AIR PRESSURE	( )	( )
SOLENOID VALVES	( )	( )

CORRECTIVE ACTION TAKEN: ______________________

DATE: ______________

BAG FAILURE	TOP	MIDDLE	BOTTOM
( ) TEARS	( )	( )	( )
( ) TORN SEAMS	( )	( )	( )
( ) PIN HOLES	( )	( )	( )

WHICH CELL: ______________
NO. BAGS REPLACED: ______________
CORRECTIVE ACTION TAKEN: ______________________

DATE: ______________

CAGE CONDITION: BENT: __________ BROKEN: __________ TIME: __________

CELL #: __________ NUMBER OF CAGES: __________ DATE: __________

WEEKLY MAGNAHELIC READINGS

CELL #	MON	TUES	WED	THUR	FRI	SAT	SUN
1							
2							
3							
4							
5							

QUARTERLY VISOLITE TEST:
DATE: __________
RESULTS: ______________________

CORRECTIVE ACTION TAKEN: ______________________

Supplement B

Point Source Ventilation Systems

Inspection and Maintenance Procedures

ASARCO Glover Plant
Blast Furnace Area and Sinter Building
Point Source Ventilation System
Inspection and Maintenance Procedures

<u>Introduction</u>

The Point Source Ventilation (PSV) Systems are designed to collect air from fugitive dust emission sources. The collected air (and the dust contained in it) is then routed to a baghouse where the dust is captured and subsequently accumulated for reprocessing.

The PSV systems for the blast furnace area include: 1) the front of the furnace and tapping area; 2) the receiving (dross) kettles; and 3) the top of the furnace. The PSV systems for the sinter building include: 1) sinter plant process gases; 2) sinter building ventilation; and 3) other conveying, crushing and mixing equipment PSV systems.

These systems undergo routine, periodic inspections to insure proper operation. The systems are also inspected prior to initiation of blast furnace operations after a period of down time greater than 1 day.

<u>Routine Inspection Frequency</u>

Routine inspections will be performed once per quarter. As part of these routine quarterly inspections, the Triboflow (or MDNR approved equivalent) continuous particulate monitors will be calibrated as necessary to alert operators when particulate levels in the exhaust gases are above those seen during normal bag cleaning cycles, subject to MDNR's right to observe, review and approve such calibration of the monitors.

<u>Inspection Procedures</u>

Visual Inspection - A visual inspection of the mechanical and physical condition of the systems is the fundamental procedure to be used. Any deficiencies will be noted and will be the subjects of the subsequent Work Order that will be submitted.

Air Flow Measurements - Sinter Building ventilation gases will be continuously measured and recorded. These rates will be recorded at a minimum of five minute intervals. The sinter process gas baghouse fan amperage will be recorded continuously (see explanation below). Other ventilation rates will be measured quarterly. The measured ventilation rates/fan amperages must be maintained above the following minimums:

Source/Area Ventilated	**Minimum Air Flow/Fan Amperage**	**Point of Measurement**	**Measurement Frequency**
Blast Furnace Ventilation - Total Flow	60,000 acfm	Just prior to spray chamber	Quarterly
Dross Kettles	15,000 acfm	Just downstream of the fan	Quarterly
Front of Blast Furnace	22,000 acfm	In flue leading to the sinter plant ventilation baghouse	Quarterly
Sinter Building Ventilation	100,000 acfm	90 inch flue leading from the header system to the intake at the baghouse	Continuously
Sinter Machine Process Gases	"*"		Continuously / Quarterly

The Sinter Plant Supervisor is responsible for assuring that the minimum ventilation rates are being met. If the calculated ventilation rates fall below these minimums, the Sinter Plant Supervisor will submit the appropriate work order for repairs. The corrective actions will be noted on an inspection report, and Environmental Department will be notified.

These minimum ventilation rates/fan amperages will not apply when systems are not being operated, during start-up or shutdown of the ventilation systems, during baghouse cleaning or repair, during cellar cleaning, during maintenance, or other conditions non-representative of normal operating conditions. If any of these conditions apply, they will be noted on the inspection report.

If for any reason the minimum ventilation rates cannot be met, the ventilation systems will be inspected. Based on this inspection the next course of action will be chosen. This could include one of the following options: 1) reduce process rates as much as possible to minimize emissions, 2) provide alternate ventilation, or 3) begin complete cessation of the associated process.

Copies of all ventilation inspections will be sent to MDNR on a quarterly basis.

"*" - Under the supervision of MDNR (post construction), Method 2 tests will be conducted (40 CFR pt. 60 Appendix A) to measure actual process gas flowrate while varying sinter process gas baghouse fan amperage. A relationship of fan amperage to actual flowrate will be developed.

The total ventilation of the Sinter Building will be designed to meet a 200 foot per minute nominal face velocity. Fan amperage will be continuously recorded. A minimum fan amperage (corresponding to the 100,000 acfm design criteria) will be added to the above table.

In addition to the continuous recording of fan amperage, quarterly measurements will be made to ensure that equipment efficiencies remain the same, and that the design 200 foot per minute face velocity is maintained. If these quarterly tests indicate that the original relationship of process gas flowrate to fan amperage is no longer correct, new Method 2 testing will be conducted to establish a new fan amperage to process gas flowrate relationship.

Supplement C

Road Vacuum Sweeper

Operation and Maintenance Procedures

Information from Road Sweeper vendor will be inserted in this section.

Supplement D

Quarterly Baghouse Inspections

Quarterly Baghouse Inspections

Procedure for Visolite® Baghouse Leak Detection Testing

Ventilation Baghouse:

1. Visolite® testing is normally done on sinter plant down days each quarter or when leaks are suspected that cannot be found by visual inspection.

2. The baghouse fan is operating, the air impulse (bag cleaning) system is off.

3. Visolite® in the appropriate amount is introduced into the inlet manifold to each module through the 2-inch nipple provided.

4. After 1.5 minutes the top (inlet) damper to the module is closed.

5. The cell is checked with the ultraviolet light and all leaks repaired.

6. The test is repeated through all five modules.

Sinter Machine Baghouse:

1. Visolite® testing is normally done on sinter plant down days each quarter or when leaks are suspected that cannot be found by visual inspection.

2. The Visolite® inspection is a duplication of the above for the six modules in the baghouse.

ASARCO Design Baghouse - Sinter Building Ventilation:

1. Visolite® testing is normally done on sinter plant down days each quarter or when leaks are suspected that cannot be found by visual inspection.

2. The main baghouse fan is operating.

3. The shaking system is turned off.

4. 1,2,3 cellar dampers are open.

5. 4,5,6,7,8,9 cellar dampers are closed.

6. The appropriate amount of Visolite® is dumped into provided port on the inlet side of the baghouse fan.

7. The fan is operated for 1.5 minutes.

8. Shut off fan.

9. Check for leaks in the first three cellars with the ultraviolet light (UV).

10. Repair any leaks found.

11. Repeat this procedure in groups of three cellars.

APPENDIX B

Doe Run – Glover Redesignation Request Dispersion Modeling Review

MEMORANDUM

DATE: August 26, 2003

TO: John Rustige, P.E., Environmental Engineer
Planning Section, Air Pollution Control Program

FROM: Jeffry D. Bennett, P.E., Air Quality Modeling Unit Chief
Technical Support Section, Air Pollution Control Program

SUBJECT: Doe Run – Glover Redesignation Request Dispersion Modeling Review

I. Introduction

In support of the redesignation request for the Doe Run – Glover lead nonattainment area, Shell Engineering has submitted dispersion modeling that supports the continued attainment of the lead National Ambient Air Quality Standard (NAAQS) in this area. This modeling can be considered a "true-up" analysis to the previous attainment demonstration prepared in 1996. Doe Run has made minor changes to the operation at the Glover smelter (including installation of additional control devices) and these changes are reflected in the current modeling analysis.

II. Related Documents

The modeling file includes correspondence, modeling input and output files, and other review materials. Due to the time constraints associated with this project and the extraordinary amount of time needed to complete the modeling exercise, there are several sets of distinct, but related modeling files that were utilized to determine final concentrations that led to the finding of continued attainment. All input/output files used in the final calculations are included in the modeling file, while a myriad of sensitivity analysis input/output files are not.

III. Modeling Methodology

The selected model for this application is the Industrial Source Complex - Short Term (ISCST3) model (version 02035). The ISCST3 is an Environmental Protection Agency (EPA) approved model that can be used to assess concentrations from several types of sources associated with industrial source complexes. Additionally, it can account for building downwash, urban or rural dispersion coefficients, flat or elevated terrain, and averaging periods from one hour to one year. The ISCST3 is an appropriate model for this study.

Based on an evaluation of the surrounding area, the rural land use classification was chosen by Shell Engineering. This choice is appropriate for this exercise.

The meteorological data set used in the modeling analysis was developed primarily from surface observations at the on-site Post Office meteorological station and the Springfield, Missouri upper air site. This dataset includes 15 quarters of meteorological data from January 1997 to December 2000. Due to a large number of missing hours from the Post Office station and the fairly robust on-site meteorological dataset, the 4th quarter of 1999 was eliminated from consideration. The remaining parameters for the use of the dry depletion algorithms utilized in ISCST3 were collected from surface data at Springfield (MO) regional airport (#13995). The development of the meteorological data is detailed in the modeling report submitted by Shell Engineering and the methodologies have been approved by the Air Pollution Control Program (APCP).

The receptor network utilized in the current analysis is more intensive than the previous modeling analysis conducted for the attainment demonstration. The original network contained 797 receptors around and near the Doe Run – Glover facility. In order to identify areas of high concentration that needed further scrutiny, Shell Engineering submitted a sensitivity analysis that included receptors with 50 meter spacing along the property boundary (including on-property highways) and 1 km spacing outside the property to approximately 10 km from the boundary. This sensitivity analysis showed areas of concentration exceeding 1 $\mu g/m^3$ at receptors near the plant entrance along Highway 49 and along the southern property boundary and included one receptor inside the 1 km grid. No other areas of the network had concentrations that exceeded 1 $\mu g/m^3$. The final receptor network included an additional grid with 100 meter spacing at the southwestern property boundary (surrounding the area of “high” concentration) and a 500 meter spaced network around the facility to a distance of approximately 3 kilometers. The total number of receptors in the evaluation was 1,704. The elevation data utilized for the receptors heights was obtained using the AERMAP modeling system relying on United States Geological Survey topographic DEM files for the area. The final receptor network for this project is illustrated in Figure 1.

The emission rates for this exercise were obtained primarily from the existing State Implementation Plan (SIP) and previous attainment demonstration modeling. However, as noted above, there have been some physical changes in the Glover operation since the last modeling analysis was completed as well as methodological changes in modeling practices since 1996. The following changes were identified and resulted in modifications to the input file for the modeled emission rates or release parameters from each affected source:

1) New baghouse for control of refinery fugitives
2) Unloading building roof vents have been sealed
3) Dross pot cover removal
4) Operation of a wet sweeper on in-plant haul roads
5) Haul roads were originally modeled as volume sources, but were changed to area sources following current APCP policy
6) New slag pile location
7) Blast furnace/dross/refinery fugitive emission release configuration changes

The new refinery baghouse was added to the analysis as source #40002. This source is located in close proximity to the existing refinery stack (#40001). The emissions from this source were obtained during a stack test at the facility in March 2001. Doe Run is proposing a limit that corresponds to the stack test emissions plus a 20% safety factor. The emission limit for this source is 0.0011 lb/hr (1.38E-04 g/s). This new emission point raised concerns about double-counting of emissions from the refinery area. If the new baghouse is controlling some of the previously identified fugitive emission sources in the refinery, then the emission rates from these fugitive sources must be reduced by an appropriate amount to account for this additional control. The following mechanism to account for these reductions was agreed upon after lengthy discussion between APCP staff and Shell Engineering:

1) Determine the refinery fugitive emissions from the 1996 SIP (0.0321 g/s).
2) Use the raw stack test data as a measure of current baghouse emissions (1.15E-04 g/s)
3) Using a 99% control efficiency for lead in the baghouse, calculate a pre-baghouse emission rate (0.0115 g/s) <= 1.15E-04 g/s * (100/(100-99)
4) Subtract the pre-baghouse emission rate from the existing fugitive to obtain a corrected fugitive emission rate (0.0321 g/s – 0.0115 g/s = 0.0206 g/s)

The unloading building roof vents have been sealed since the development of the 1996 modeling exercise. The emissions from the unloading building were relocated to the north and north-east doors of the building. The emissions were apportioned equally between the two openings. NOTE: this change in configuration could lead to reduced emissions from unloading building fugitives (based on good operating practices). However, the emissions from the roof vents were unchanged in the analysis and were only moved to the appropriate building openings.

Testing conducted by Doe Run before and after this change suggests reduced emissions are achieved through the use of cooling only and not through the use of ventilated pot covers. However, due to the high control efficiency associated with this process in the 1996 SIP, the dross pot cover removal was not credited for any emission reductions during this analysis.

The addition of the wet sweeper on in-plant haul roads was credited as a 50% reduction in certain haul road emission rates. The haul road release characteristics were changed to reflect current APCP policy. Haul roads were previously modeled as volume sources and now they are modeled as area sources with the following release characteristics: release height = 0.0 m and initial vertical dimension (σ_{zinit}) = 1.40 m. In addition, the x/y dimension aspect ratio is never allowed to be greater than 10:1.

The in-plant haul road locations and emissions were adjusted to reflect the new slag pile location on the property. This change was precipitated as a result of a recent site visit to the Glover facility and communication from Glover personnel. The emission rate and location changes are reflected in the appropriate roadway segments (Road Segment IJ).

Also, based on observations during the site visit and data collected in the previous SIP, changes were made to the emission rates and release parameters for blast furnace/dross/refinery building fugitives. First, 25% of the blast furnace fugitive emissions were assumed to be released from the large building opening to the east of the blast furnace area. Second, due to the substantial heat load over the furnace and the current building configuration, the remaining 75% of blast furnace fugitive emissions were apportioned as 40% from each of the northern roof vents (30101/30102) and 10% from each of the southern roof vents (30103/30104). The northern vents are closer to the emission sources for the area and are located above the blast furnace. As noted above, the refinery fugitive emissions were redefined by the new baghouse inclusion. In addition, the remaining fugitive emissions were concentrated more closely to the actual release point. The two northern refinery roof vent sources were assumed to emit 45% of the total remaining fugitives and the southern roof vent was assumed to emit 10%. The two northern vents are located above the kettle area and are in close proximity to the major handling and transfer operation in the refinery area. These changes in emission release configuration were designed to reflect the actual operation at the facility and are conservative in nature. The conservatism is gained by placing more emissions in a smaller volume instead of assuming total building length to calculate the emission release. The final inventory emission rate and release parameters were developed by Shell

Engineering with extensive input from APCP personnel and are included in Tables 1, 2, and 3. Tables 4, 5, and 6 compare the emission rates used in the current State Implementation Plan to the "new" modeling analysis presented here. Diagrams of all current source locations have been provided by Shell Engineering and are attached for clarification. For clarification, Figures 2A and 2B identify the locations of in-plant and all haul road locations, respectively.

TABLE 1 - Point Source Parameters

Source #	Description	Emission Rate (g/s)	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)
10001	Sample Prep Baghouse	1.24E-03	4.6	297.4	18.52	0.40
20004	Sinter Plant Baghouse	5.72E-01	71.5	309.7	24.30	2.11
20005	Main Stack	8.41E-01	186.6	405.3	15.08	3.60
30001	Blast Furnace Baghouse	3.76E-01	65.0	343.0	20.08	2.30
30002	Dross Kettle Combustion	9.18E-04	9.6	588.0	11.91	1.20
40001	Refinery Kettle Combustion	8.52E-03	25.6	463.6	7.69	1.20
40002	"New" Refinery Baghouse	**1.38E-04**	**9.1**	**316.5**	**15.4**	**0.91**
50001	Lab Assay Vent	3.30E-03	9.4	295.0	14.6	0.56

TABLE 2 - Volume Source Parameters

Source #	Description	Emission Rate (g/s)	Release Height (m)	σ_{yinit} (m)	σ_{zinit} (m)
20101	Unloading Building Fugitives-North Door	**2.49E-02**	**18.8**	**1.77**	**3.0**
20102	Unloading Building Fugitives – East Door	**2.49E-02**	**11.1**	**2.13**	**5.17**
20203	Sinter Plant Fugitives	8.50E-03	11.3	20.93	10.47
30101	Blast Furnace Building Roof Vent	8.90E-03	26.5	6.21	0.93
30102	Blast Furnace Building Roof Vent	8.90E-03	26.5	6.21	0.93
30103	Blast Furnace Building Roof Vent	2.23E-03	26.5	6.21	0.93
30104	Blast Furnace Building Roof Vent	2.23E-03	26.5	6.21	0.93
30110	"New" Blast Furnace Building East Opening	**7.42E-03**	**13.3**	**12.79**	**6.14**
40101	Refinery Building Roof Vent	9.27E-03	26.5	6.21	0.93
40102	Refinery Building Roof Vent	9.27E-03	26.5	6.21	0.93
40103	Refinery Building Roof Vent	2.06E-03	26.5	6.21	0.93
60005	Blast Furnace Baghouse Cleanout	1.21E-02	12.8	19.50	1.22

TABLE 3 - Area Source Parameters

Source #	Description	Emission Rate (g/sm^2)	Release Height (m)	X_{init} (m)	Y_{init} (m)	Angle (^{o})	σ_{zinit} (m)
80001	Road QR	8.00E-08	0.0	50	10	0	1.40
80002	Road QM1	1.41E-09	0.0	50	10	20	1.40
80003	Road QM2	1.41E-09	0.0	50	10	74	1.40
80004	Road QM3	1.41E-09	0.0	10	50	0	1.40
80005	Road QM4	1.41E-09	0.0	10	50	13	1.40
80006	Road QM5	1.41E-09	0.0	50	10	17	1.40
80007	Road LQ	4.41E-08	0.0	10	100	22	1.40
80008	Road FG	1.31E-08	0.0	100	10	86	1.40
80009	Road EG	3.88E-08	0.0	50	10	25	1.40
80010	Road EP	3.56E-08	0.0	75	10	17	1.40
80011	Road AP	8.79E-08	0.0	75	10	17	1.40
80012	Road OP	1.02E-08	0.0	10	75	20	1.40
80013	Road NP	2.69E-08	0.0	10	75	20	1.40
80014	Road EH	1.39E-08	0.0	10	100	18	1.40
80015	Road HI1	1.14E-08	0.0	10	100	18	1.40
80016	Road HI2	1.14E-08	0.0	10	50	35	1.40
80017	Road HI3	1.14E-08	0.0	100	10	58	1.40
80018	Road HI4	1.14E-08	0.0	100	10	75	1.40
80019	Road IK1	6.20E-08	0.0	10	100	18	1.40
80020	Road IK2	6.20E-08	0.0	10	100	18	1.40
80021	Road KL1	2.53E-09	0.0	10	100	18	1.40
80022	Road KL2	2.53E-09	0.0	10	100	18	1.40
80023	Road KL3	2.53E-09	**1.0**	25	10	0	1.40
80024	Road IJ1	2.42E-07	0.0	25	10	19	1.40
80025	Road IJ2	2.42E-07	0.0	10	75	0	1.40
80026	Road IJ3	2.42E-07	0.0	10	100	68	1.40
80027	Road IJ4	2.42E-07	0.0	10	75	64	1.40
80028	Road IJ5	2.42E-07	0.0	75	10	67	1.40
80029	Road IJ6	2.42E-07	0.0	10	100	68	1.40
80030	Road IJ7	2.42E-07	0.0	75	10	30	1.40
80031	Road BS1	8.18E-10	0.0	10	100	-1	1.40
80032	Road BS2	8.18E-10	0.0	10	100	-1	1.40
80033	Road RB1	8.65E-10	0.0	10	100	-1	1.40
80034	Road RB2	8.65E-10	0.0	10	100	-1	1.40
80035	Road RB3	8.65E-10	0.0	10	100	-1	1.40
80036	Road RB4	8.65E-10	0.0	10	100	-18	1.40
80037	Road RB5	8.65E-10	0.0	10	100	-13	1.40
80038	Road RB6	8.65E-10	0.0	10	100	-11	1.40
80101	Road H49S1	7.15E-10	0.0	10	100	0	1.40

80102	Road H49S2	7.15E-10	0.0	10	100	0	1.40
80103	Road H49S3	7.15E-10	0.0	10	100	-7.7	1.40
80104	Road H49S4	7.15E-10	0.0	10	100	-17.0	1.40
80105	Road H49S5	7.15E-10	0.0	10	100	-14.9	1.40
80106	Road H49S6	7.15E-10	0.0	10	100	-13.5	1.40
80107	Road H49S7	7.15E-10	0.0	10	100	-12.1	1.395
80108	Road H49S8	7.15E-10	0.0	10	100	6.25	1.395
80109	Road H49S9	7.15E-10	0.0	10	100	-4.7	1.395
80110	Road H49S10	7.15E-10	0.0	10	100	-9.5	1.395
80111	Road H49S11	7.15E-10	0.0	10	100	-1.6	1.395
80112	Road H49S12	7.15E-10	0.0	10	75	0	1.395
80113	Road H49S13	7.15E-10	**1.0**	10	25	34	1.395
80114	Road H49S14	7.15E-10	0.0	10	100	3.5	1.395
80115	Road H49S15	7.15E-10	0.0	10	100	-0.9	1.395
80116	Road H49S16	7.15E-10	0.0	10	100	-0.9	1.395
80117	Road H49S17	7.15E-10	0.0	10	100	-0.9	1.395
80118	Road H49S18	7.15E-10	0.0	10	100	-0.9	1.395
80119	RoadH49N1	1.37E-08	0.0	10	100	-11.4	1.395
80120	RoadH49N2	1.37E-08	0.0	10	100	-11.4	1.395
80121	RoadH49N3	1.37E-08	0.0	10	100	-1.3	1.395
80122	RoadH49N4	1.37E-08	0.0	10	100	-1.3	1.395
80123	RoadH49N5	1.37E-08	0.0	10	100	5.0	1.395
80124	RoadH49N6	1.37E-08	0.0	10	100	0.3	1.395
80125	RoadH49N7	1.37E-08	0.0	10	100	-14.1	1.395
80126	RoadH49N8	1.37E-08	0.0	10	100	-14.1	1.395
80127	RoadH49N9	1.37E-08	0.0	10	100	-14.1	1.395
80128	RoadH49N10	1.37E-08	0.0	10	100	-18	1.395
80129	RoadH2172A	1.37E-08	0.0	10	100	-8.4	1.395
80130	RoadH2172B	1.45E-08	0.0	10	100	-8.4	1.395
80131	RoadH2172C	1.45E-08	0.0	10	100	-8.4	1.395
80132	RoadH2172D	1.45E-08	0.0	10	100	-8.4	1.395
80133	RoadH2172E	1.45E-08	0.0	10	100	-8.4	1.395
80134	RoadH2172F	1.45E-08	0.0	10	100	-8.4	1.395
80135	RoadH2172G	1.45E-08	0.0	10	100	-8.4	1.395
80136	RoadH2172H	1.45E-08	0.0	10	100	-8.4	1.395
80137	RoadH2172I	1.45E-08	0.0	10	100	-8.4	1.395
80138	RoadH2172J	1.45E-08	0.0	10	100	-0.4	1.395
80139	RoadH2172K	1.45E-08	0.0	10	100	1.1	1.395
80140	RoadH2172L	1.45E-08	0.0	10	100	1.1	1.395
80141	RoadH2172M	1.45E-08	0.0	10	100	1.1	1.395
80142	RoadH2172N	1.45E-08	0.0	10	100	1.1	1.395
80143	RoadH2172O	1.45E-08	0.0	10	100	1.1	1.395
80144	RoadH2172P	1.45E-08	0.0	10	100	-20.2	1.395

80145	RoadH2172Q	1.45E-08	0.0	10	100	-20.2	1.395
80146	RoadH2172R	1.45E-08	0.0	10	100	-20.2	1.395
80147	RoadH2172S	1.45E-08	0.0	10	100	-18.9	1.395
80148	RoadH2172T	1.45E-08	0.0	10	100	-18.9	1.395
80149	RoadH2172U	1.45E-08	0.0	10	100	-18.9	1.395
80150	RoadH2172V	1.45E-08	0.0	10	100	14.1	1.395
80151	RoadH2172W	1.45E-08	0.0	10	100	14.1	1.395
80152	RoadH2172X	1.45E-08	0.0	10	100	17	1.395

TABLE 4 - Point Source Emission Rate Comparison

Source #	Description	Current Emission (g/s)	1996 SIP Emissions (g/s)	Reason For Change
10001	Sample Prep Baghouse	1.24E-03	1.24E-03	
20004	Sinter Plant Baghouse	5.72E-01	5.72E-01	
20005	Main Stack	8.41E-01	8.41E-01	
30001	Blast Furnace Baghouse	3.76E-01	3.76E-01	
30002	Dross Kettle Combustion	9.18E-04	9.18E-04	
40001	Refinery Kettle Combustion	8.52E-03	8.52E-03	
40002	"New" Refinery Baghouse	**1.38E-04**	**N/A**	**Stack test data + 20% factor**
50001	Lab Assay Vent	3.30E-03	3.30E-03	

TABLE 5 - Volume Source Emission Rate Comparison

Source #	Description	Current Emission (g/s)	1996 SIP Emissions (g/s)	Reason for Change
20101	Unloading Building Fugitives-North Door	**2.49E-02**		
20102	Unloading Building Fugitives – East Door	**2.49E-02**		
Total	Unloading Building Fugitives	4.98E-02	4.98E-02	Roof vents closed, emissions relocated to north/east doors
20203	Sinter Plant Fugitives	8.50E-03	8.50E-03	
30101	Blast Furnace Building Roof Vent	8.90E-03	7.42E-03	80% of remaining blast furnace fugitives (75%) are emitted from 30101/30102
30102	Blast Furnace Building Roof Vent	8.90E-03	7.42E-03	
30103	Blast Furnace Building Roof Vent	2.23E-03	7.42E-03	20% of remaining blast furnace fugitives (75%) are emitted from 30103/30104

30104	Blast Furnace Building Roof Vent	2.23E-03	7.42E-03	
30110	"New" Blast Furnace Building East Opening	**7.42E-03**		**25% of total BF fugitives were modeled through the east building opening**
Total	Blast Furnace Building Fugitives	2.97E-02	2.97E-02	Total blast furnace fugitive emissions are identical
40101	Refinery Building Roof Vent	9.27E-03	1.07E-02	45% of total refinery fugitives (40101/40102)
40102	Refinery Building Roof Vent	9.27E-03	1.07E-02	
40103	Refinery Building Roof Vent	2.06E-03	1.07E-02	10% of total refinery fugitives
Total	Refinery Building Fugitives	2.06E-03	3.21E-02	New fugitives = old fugitives-new baghouse (pre-control)
60005	Blast Furnace Baghouse Cleanout	1.21E-02	6.05E-02	Limited to 1 day/week, old SIP had 5 days/week limit

TABLE 6 - Area Source Emission Rate Comparison

Source #	Description	Current Modeled Emission (g/s)	1996 SIP Emission (g/s)	Reason for Change
80001	Road QR	4.00E-05	8.00E-05	50% control for wet sweeper
80002-6	Road QM	3.52E-06	7.04E-06	50% control for wet sweeper
80007	Road LQ	4.41E-05	8.83E-05	50% control for wet sweeper
80008	Road FG	1.31E-05	2.63E-05	50% control for wet sweeper
80009	Road EG	1.94E-05	3.88E-05	50% control for wet sweeper
80010	Road EP	2.67E-05	5.34E-05	50% control for wet sweeper
80011	Road AP	6.59E-05	1.32E-04	50% control for wet sweeper
80012	Road OP	7.65E-06	1.53E-05	50% control for wet sweeper
80013	Road NP	2.02E-05	4.04E-05	50% control for wet sweeper
80014	Road EH	1.39E-05	2.77E-05	50% control for wet sweeper
80015-18	Road HI	3.99E-05	7.97E-05	50% control for wet sweeper
80019-20	Road IK	1.24E-04	2.48E-04	50% control for wet sweeper
80021-23	Road KL	5.69E-06	1.14E-05	50% control for wet sweeper
80024-30	Road IJ	**1.27E-03**	**2.54E-03**	Current emission rate should have been 8.74E-04 g/s, due to 50% control and haul road length reduction from 757m to 521m
80031-32	Road BS	1.64E-06	1.64E-06	
80033-38	Road RB	5.19E-06	5.19E-06	
80101-118	Road H49S	1.22E-05	1.22E-05	

80119-128	RoadH49N	1.37E-04	1.31E-04	Slight discrepancy, but higher emissions (conservative)
80129-152	RoadH2172	3.47E-04	3.36E-04	Slight discrepancy, but higher emissions (conservative)

The particle data from the 1996 attainment demonstration was used for all the sources except the sinter, blast furnace, and refinery fugitives. Fugitive particle data from the Herculaneum modeling exercise was incorporated for these sources. This data was collected at Herculaneum and replaces off-site data used in the previous attainment demonstration.

IV. Modeling Results

This modeling exercise was completed to demonstrate attainment and maintenance of the quarterly lead NAAQS (1.5 μg/m^3) based on the current operations at the Doe Run – Glover facility. The results do indicate that this NAAQS will be attained. In order to provide timely completion of the modeling exercise for inclusion in the redesignation request, two different set of modeling were accomplished. The first set utilized the entire receptor network described above, but did not include the dry depletion option available in the ISCST3 model. This option allows for removal (depletion) of particles that come in contact with the ground based on the characteristics of each emission source.

The results from this exercise showed that 62 receptors exceeded 1 μg/m^3 (not including background) and that 19 receptors would exceed the 1.5 μg/m^3 NAAQS (including background of 0.14 μg/m^3). The second set of analysis investigated the concentration at all receptors that predicted concentrations greater than 1 μg/m^3 with the dry depletion option included. The only sources that were not included in this modeling set were the road sources. The concentrations from the road sources were included in the final calculation by adding the contribution from road sources (without depletion) to the other source concentrations with depletion for each quarter. The highest impact of the road sources without depletion was 0.03 μg/m^3. The road contribution to the overall concentration does not influence the high concentration receptors to a large degree.

The modeling results are summarized in the following tables: Table 7 contains the highest concentrations for the initial screening analysis for each quarter (including background), Table 8 contains the receptors in the original screening analysis over 1 μg/m^3, Table 9 contains the final concentration for the 62 receptors in Table 8 (including depletion concentrations, non-depletion road source concentrations, and background concentration), and Table 10 includes the highest remaining concentrations for each quarter from the screened receptors.

Figure 3 illustrates the receptors over 1.14 μg/m^3 (including background) along with the other receptors in proximity to the plant.

Table 7 - Maximum Quarterly Concentrations (Screening Analysis)

Quarter	Concentration (μg/m^3)	UTM-Easting (m)	UTM-Northing (m)
1st 1997	1.060	704,144.9	4,151,251
2nd 1997	**1.608**	703,381.4	4,148,840
3rd 1997	**1.761**	703,381.4	4,148,840
4th 1997	**1.570**	703,481.3	4,148,845
1st 1998	1.182	703,681.0	4,148,856
2nd 1998	1.287	704,144.9	4,151,251
3rd 1998	1.335	704,154.8	4,151,152
4th 1998	1.367	704,144.9	4,151,251
1st 1999	1.472	703,681.0	4,148,856
2nd 1999	**1.603**	703,481.3	4,148,845
3rd 1999	**1.841**	703,431.4	4,148,843
1st 2000	1.434	703,581.2	4,148,851
2nd 2000	1.393	703,481.3	4,148,845
3rd 2000	**2.022**	703,381.4	4,148,840
4th 2000	1.464	703,481.3	4,148,845

Table 8 - Receptors with Concentrations over 1 μg/m^3 (without background)

Receptor #	UTM-Easting (m)	UTM-Northing (m)	Concentration	Maximum Quarter
1	703,381.4	4,148,840	1.882	3rd 2000
2	703,341.0	4,148,754	1.856	3rd 2000
3	703,331.5	4,148,837	1.851	3rd 2000
4	703,431.4	4,148,843	1.846	3rd 2000
5	703,481.3	4,148,845	1.717	3rd 2000
6	703,341.0	4,148,654	1.702	3rd 2000
7	703,441.0	4,148,754	1.681	3rd 2000
8	703,281.6	4,148,835	1.661	3rd 2000
9	703,341.0	4,148,554	1.605	3rd 2000
10	703,241.0	4,148,554	1.564	3rd 2000
11	703,241.0	4,148,754	1.546	3rd 2000
12	703,241.0	4,148,654	1.544	3rd 2000
13	703,241.0	4,148,454	1.525	3rd 2000
14	703,231.7	4,148,832	1.481	3rd 2000
15	703,531.3	4,148,848	1.468	3rd 1999
16	703,441.0	4,148,654	1.431	3rd 2000

17	703,341.0	4,148,454	1.413	3rd 2000
18	703,241.0	4,148,354	1.400	3rd 2000
19	703,581.2	4,148,851	1.394	2nd 1999
20	703,681.0	4,148,856	1.332	1st 1999
21	703,730.9	4,148,859	1.322	1st 1999
22	703,541.0	4,148,754	1.309	2nd 1999
23	703,631.1	4,148,854	1.293	1st 2000
24	703,141.0	4,148,554	1.285	3rd 2000
25	703,181.8	4,148,829	1.263	3rd 2000
26	703,341.0	4,148,354	1.254	3rd 2000
27	703,141.0	4,148,454	1.247	3rd 2000
28	703,241.0	4,148,254	1.240	3rd 2000
29	703,441.0	4,148,554	1.235	3rd 1999
30	704,144.9	4,151,251	1.227	4th 1998
31	703,141.0	4,148,654	1.217	3rd 2000
32	703,141.0	4,148,354	1.215	3rd 2000
33	703,780.9	4,148,862	1.212	1st 1999
34	704,154.8	4,151,152	1.195	3rd 1998
35	703,641.0	4,148,754	1.179	1st 1999
36	703,141.0	4,148,754	1.177	3rd 2000
37	704,178.0	4,151,055	1.176	3rd 1998
38	704,166.4	4,151,103	1.172	3rd 1998
39	704,143.6	4,151,301	1.170	4th 1998
40	704,147.7	4,151,201	1.161	4th 1998
41	703,541.0	4,148,654	1.149	2nd 1999
42	704,188.2	4,151,006	1.125	3rd 1998
43	703,741.0	4,148,754	1.125	1st 1999
44	703,141.0	4,148,254	1.100	3rd 2000
45	703,641.0	4,148,654	1.089	1st 1999
46	703,041.0	4,147,954	1.078	3rd 2000
47	703,441.0	4,148,454	1.071	2nd 1999
48	703,041.0	4,147,854	1.066	3rd 2000
49	703,341.0	4,148,254	1.064	3rd 2000
50	703,141.0	4,147,954	1.051	3rd 2000
51	704,197.9	4,150,957	1.045	3rd 1998
52	703,131.8	4,148,826	1.045	3rd 2000
53	703,041.0	4,148,054	1.041	3rd 2000
54	703,141.0	4,147,854	1.028	3rd 2000
55	704,142.2	4,151,351	1.024	4th 1998
56	702,941.0	4,147,854	1.022	3rd 2000
57	703,141.0	4,148,154	1.016	3rd 2000
58	702,941.0	4,147,954	1.016	3rd 2000
59	703,641.0	4,148,554	1.016	1st 1999

60	703,241.0	4,148,154	1.012	3rd 2000
61	703,141.0	4,148,054	1.004	3rd 2000
62	703,541.0	4,148,554	1.002	2nd 1999

Table 9 – Final Concentrations for Screened Receptors (no background)

Receptor #	UTM-Easting	UTM-Northing	Concentration (no depletion)	Final Conc	Quarter
1	703,381.4	4,148,840	1.882	1.088	3rd 2000
2	703,341.0	4,148,754	1.856	1.112	3rd 2000
3	703,331.5	4,148,837	1.851	1.100	3rd 2000
4	703,431.4	4,148,843	1.846	1.050	3rd 2000
5	703,481.3	4,148,845	1.717	0.974	3rd 2000
6	703,341.0	4,148,654	1.702	0.997	3rd 2000
7	703,441.0	4,148,754	1.681	0.962	3rd 2000
8	703,281.6	4,148,835	1.661	0.975	3rd 2000
9	703,341.0	4,148,554	1.605	0.947	3rd 2000
10	703,241.0	4,148,554	1.564	0.937	3rd 2000
11	703,241.0	4,148,754	1.546	0.909	3rd 2000
12	703,241.0	4,148,654	1.544	0.908	3rd 2000
13	703,241.0	4,148,454	1.525	0.915	3rd 2000
14	703,231.7	4,148,832	1.481	0.871	3rd 2000
15	703,531.3	4,148,848	1.468	0.828	3rd 1999
16	703,441.0	4,148,654	1.431	0.807	3rd 2000
17	703,341.0	4,148,454	1.413	0.815	3rd 2000
18	703,241.0	4,148,354	1.400	0.818	3rd 2000
19	703,581.2	4,148,851	1.394	0.797	2nd 1999
20	703,681.0	4,148,856	1.332	0.772	1st 1999
21	703,730.9	4,148,859	1.322	0.793	1st 1999
22	703,541.0	4,148,754	1.309	0.740	2nd 1999
23	703,631.1	4,148,854	1.293	0.738	1st 2000
24	703,141.0	4,148,554	1.285	0.750	3rd 2000
25	703,181.8	4,148,829	1.263	0.747	3rd 2000
26	703,341.0	4,148,354	1.254	0.720	3rd 2000
27	703,141.0	4,148,454	1.247	0.714	3rd 2000
28	703,241.0	4,148,254	1.240	0.700	3rd 2000
29	703,441.0	4,148,554	1.235	0.697	3rd 2000
30	704,144.9	4,151,251	1.227	0.900	4th 1998
31	703,141.0	4,148,654	1.217	0.706	3rd 2000
32	703,141.0	4,148,354	1.215	0.691	3rd 2000
33	703,780.9	4,148,862	1.212	0.756	1st 1999
34	704,154.8	4,151,152	1.195	0.870	3rd 1998
35	703,641.0	4,148,754	1.179	0.668	1st 1999
36	703,141.0	4,148,754	1.177	0.698	3rd 2000

37	704,178.0	4,151,055	1.176	0.840	3rd 1998
38	704,166.4	4,151,103	1.172	0.843	3rd 1998
39	704,143.6	4,151,301	1.170	0.848	4th 1998
40	704,147.7	4,151,201	1.161	0.852	4th 1998
41	703,541.0	4,148,654	1.149	0.645	2nd 1999
42	704,188.2	4,151,006	1.125	0.794	3rd 1998
43	703,741.0	4,148,754	1.125	0.669	1st 1999
44	703,141.0	4,148,254	1.100	0.601	3rd 2000
45	703,641.0	4,148,654	1.089	0.615	1st 1999
46	703,041.0	4,147,954	1.078	0.629	3rd 2000
47	703,441.0	4,148,454	1.071	0.596	2nd 1999
48	703,041.0	4,147,854	1.066	0.627	3rd 2000
49	703,341.0	4,148,254	1.064	0.598	3rd 2000
50	703,141.0	4,147,954	1.051	0.593	3rd 2000
51	704,197.9	4,150,957	1.045	0.724	3rd 1998
52	703,131.8	4,148,826	1.045	0.631	3rd 2000
53	703,041.0	4,148,054	1.041	0.591	3rd 2000
54	703,141.0	4,147,854	1.028	0.594	3rd 2000
55	704,142.2	4,151,351	1.024	0.726	4th 1998
56	702,941.0	4,147,854	1.022	0.617	3rd 2000
57	703,141.0	4,148,154	1.016	0.538	3rd 2000
58	702,941.0	4,147,954	1.016	0.610	3rd 2000
59	703,641.0	4,148,554	1.016	0.573	1st 1999
60	703,241.0	4,148,154	1.012	0.536	3rd 2000
61	703,141.0	4,148,054	1.004	0.540	3rd 2000
62	703,541.0	4,148,554	1.002	0.560	2nd 1999

Table 10 - Maximum Quarterly Concentrations (Final Receptors)

Quarter	Concentration ($\mu g/m^3$)	UTM-Easting (m)	UTM-Northing (m)
1st 1997	0.791	704,144.9	4,151,251
2nd 1997	1.000	703,341.0	4,148,754
3rd 1997	1.117	703,341.0	4,148,754
4th 1997	0.945	703,481.3	4,148,845
1st 1998	0.760	703,681.0	4,148,856
2nd 1998	0.904	704,144.9	4,151,251
3rd 1998	1.010	704,154.8	4,151,152
4th 1998	1.030	704,144.9	4,151,251
1st 1999	0.933	703,730.9	4,148,859
2nd 1999	0.976	703,481.3	4,148,845
3rd 1999	1.122	703,341.0	4,148,754
1st 2000	0.878	703,631.1	4,148,854

2nd 2000	0.854	703,481.3	4,148,845
3rd 2000	**1.252**	703,341.0	4,148,754
4th 2000	0.893	703,481.3	4,148,845

After the final modeling runs were complete, a typographical error was discovered for two haul road sources in the input file. These sources (80023 and 80113) were included with a release height of 1.0 m instead of 0.0 m. A sensitivity analysis was conducted with the entire receptor network to determine the maximum difference in concentration for this error in methodology for these two sources. The maximum difference for any receptor was 0.00004 mg/m^3. This difference has no impact on the findings of this review and is noted for completeness. Also, the emission rate for the "new" slag pile haul road was overestimated. The current road length is shorter than the previous configuration and, therefore, the emissions should be scaled by the ratio of the road lengths. If additional modeling is conducted, these inconsistencies should be corrected to ensure proper treatment of the road sources. However, as stated above, the road sources contributed only a very small fraction of predicted lead concentration during this review.

In summary, the results of this modeling activity demonstrate that the current operation at Doe Run – Glover will continue to comply with the lead NAAQS. The maximum concentration identified in the review was **1.252** $\mu g/m^3$ and was located to the south of the main plant along the southern property boundary.

V. Recommendations

Based on the results of this review, it is concluded that the lead NAAQS will be continue to be attained in and around Glover, Missouri. This conclusion is based on compliance with the emission rates and release parameters identified in Tables 1-3 of this memorandum.

Also, based on the modeling input file, sources 10001, 50001, and 60005 should be limited to operation between 8 AM and 4 PM. These sources are: 10001 – Sample Preparation Baghouse, 50001 – Lab Assay Vent, and 60005 – Blast Furnace Baghouse Cleanout. In addition, the blast furnace baghouse cleanout emissions were based on average emissions for cleanout one day per week.

JB:bw

Attachments

Figure 1: Doe Run Glover - Receptor Network

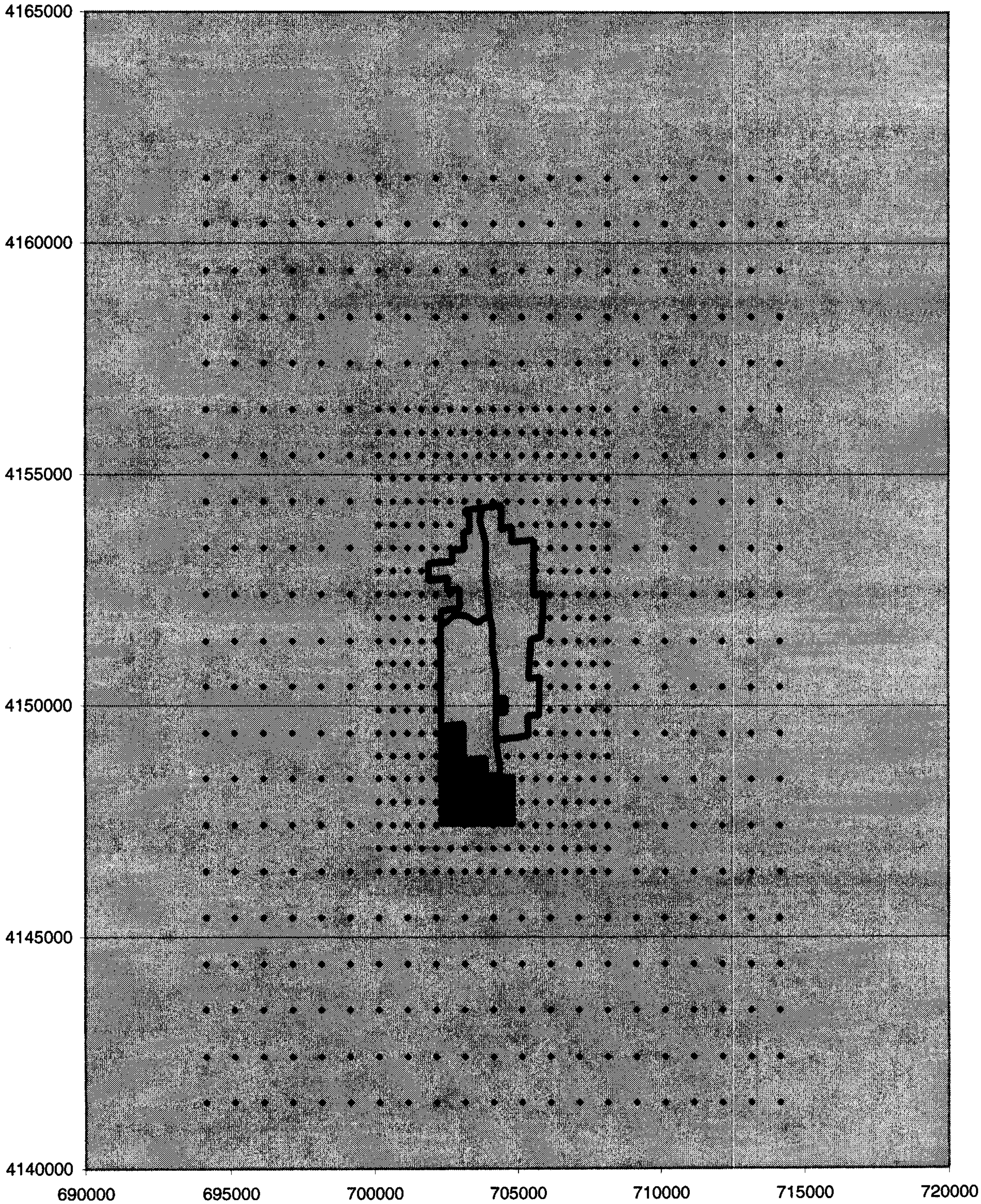


Figure 2A: In-plant Haul Road Locations

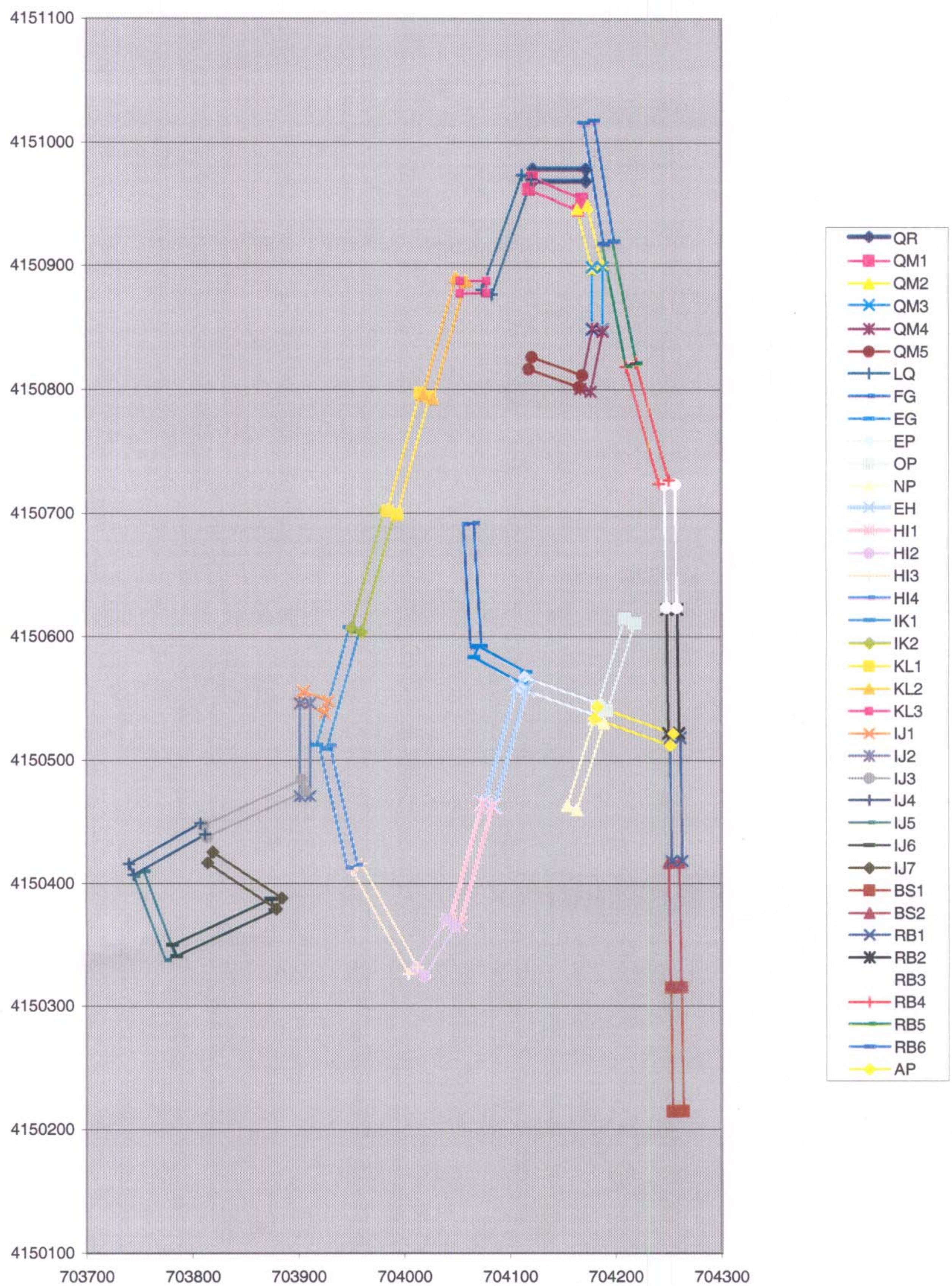


Figure 2B: All Haul Road Locations

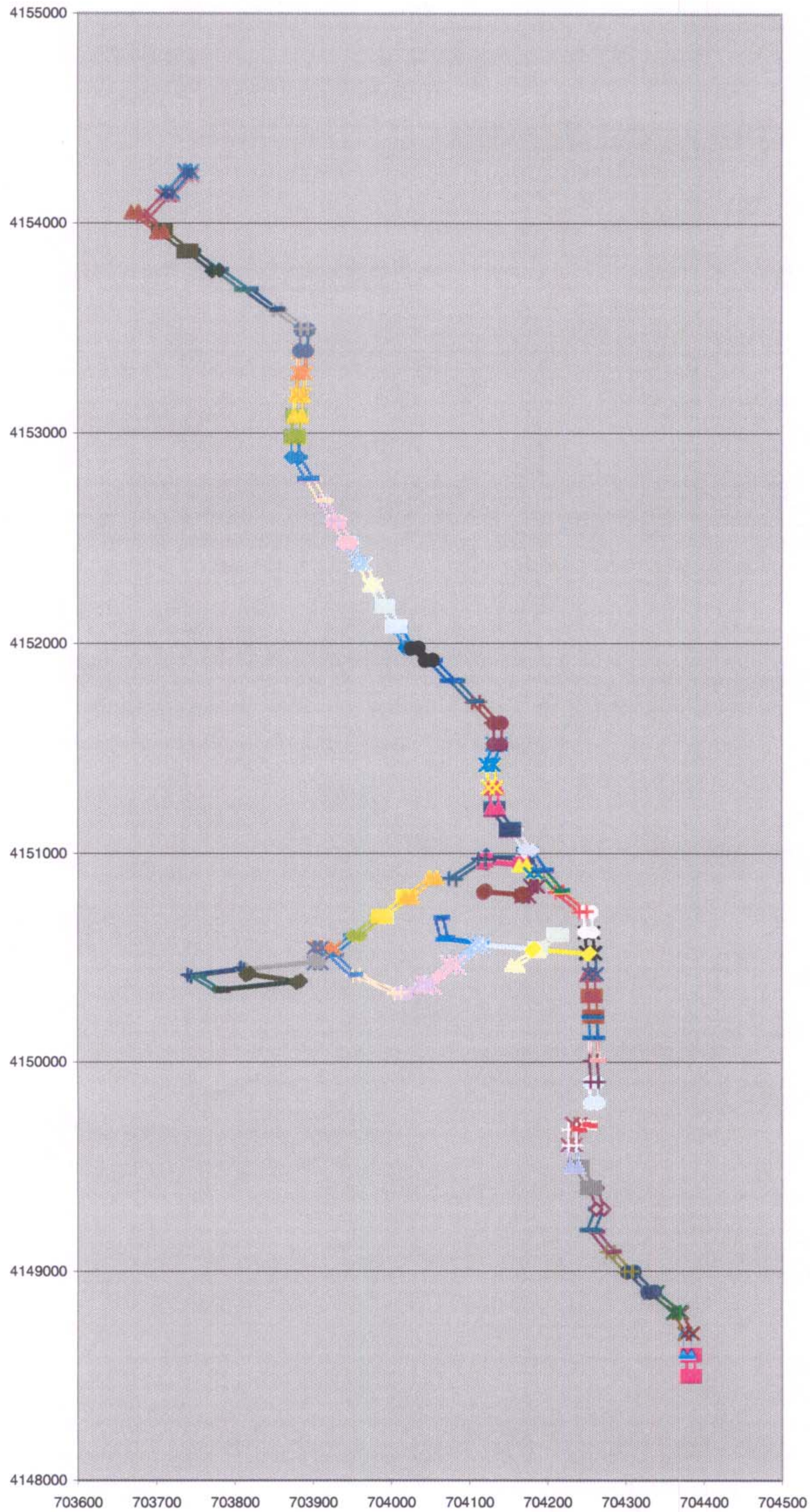


Figure 3: Receptors Greater than 1.14 ug/m3 in Initial Screening Analysis

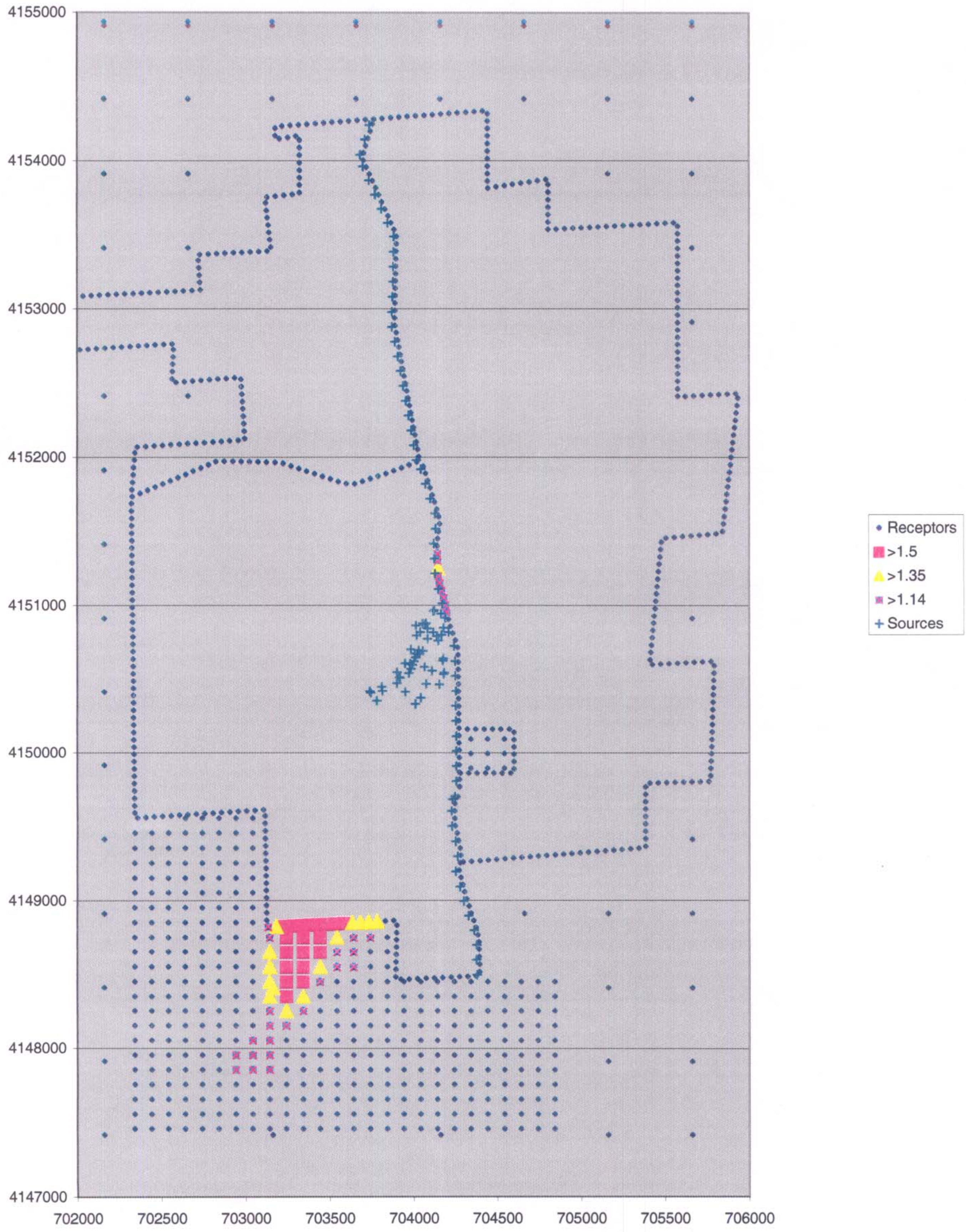


Figure 2-1 Point Source Locations

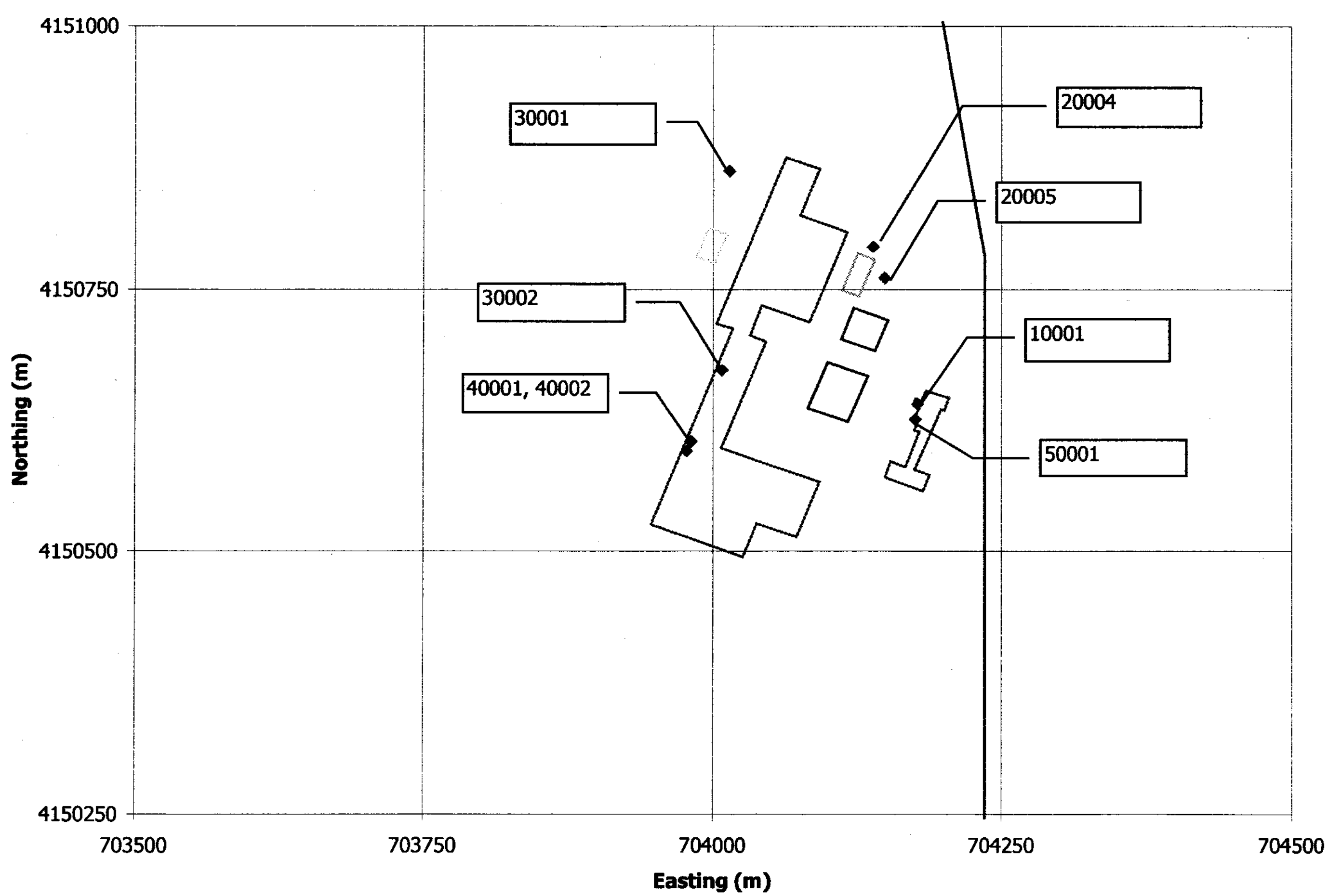


Figure 2-2. Volume Source Locations

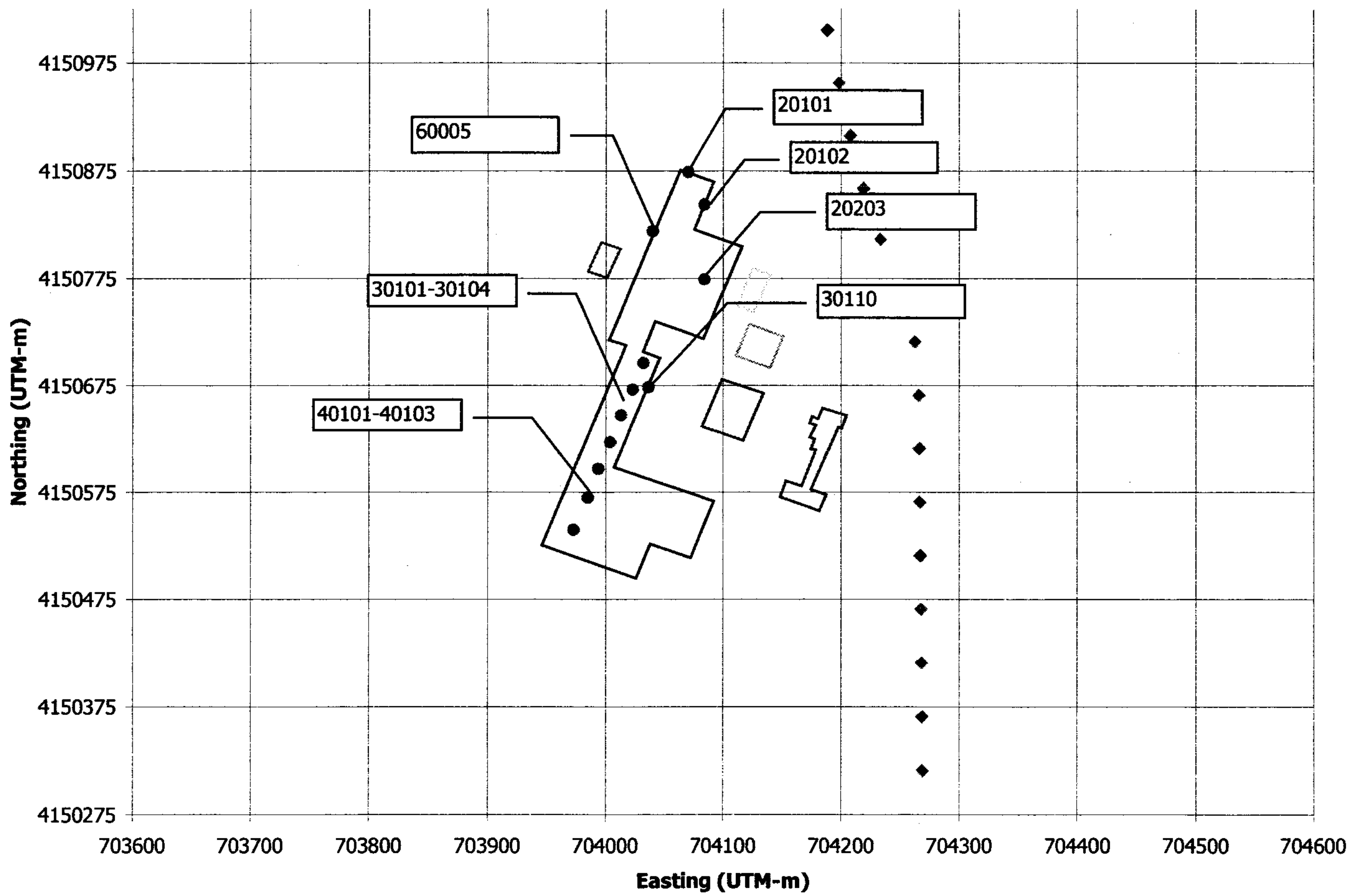


Figure 2-3. In-Plant Road Segment Locations